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SUPPLEMENTAL SITE INSPECTION REPORT

RICHARDSON FLAT TAILINGS

SUMMIT COUNTY, UTAH

TDD F08-8903-06 - PAN FUT0039HDA

EP/ ID UTD980952840

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EPA SITE ASSESSMENT PROJECT MANAGER: THOMAS BURNS

E & E PROJECT OFFICER: KEVIN MACKEY

PREPARED BY: KEVIN MACKEY AND SUSAN KENNEDY

REVIEWED BY:

SUBMITTED TO: JANET LINER, FIT-RPO
THOMAS BURNS, NPL COORDINATOR

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SUPPLEMENTAL SITE INSPECTION REFORT RICHARDSON FLAT TAILINGS SUMMIT COUNTY, UTAH TDD F08-8903-06 - PAN FUTOC39HDA EPA ID UTD980952840

1.0 INTRODUCTION

This report was prepared to satisfy the requirements of Technical Directive Document (TDD) FOF 89(3-06, issued to Ecology and Environment, Inc.'s Field Investigation :am (FIT) by the Region VIII office of the U.S. Environmental Protection Apency (EPA). This report details sampling activities and provides a discussion of analytical results for samples collected during this supplemental site inspection (SI) at Richardson Flat Tailings in Summit County, Utah.

The FIT performed the field work from July 18 through July 20, 1989. FIT members conducting this investigation included Kevin Mackey, project officer; Steve Yarbrough, site safety officer and Dan Kenney, sampler. Site access was coordinated by Tom Burns of EPA and EPA Regional Counsel. Sampling procedures used during this investigation conform to requirements established in the Region VIII Standard Operating Procedures for Field Operations at Hazardous Waste Sites (SOP III-2 E & E 1989). The sampling effort was conducted under the approved Sampling Plan (TDD F08-8903-06).

2.0 OBJECTIVES

The supplemental site inspection of Richardson Flat Tailings was designed to support EPA efforts to respond to comments on the nomination of the site to the National Priorities List under the current Hazard Ranking System. Specific objectives of field activities were to:

o Define the surface water drainage patterns throughout the site area;

- o Verify a release of inorganic contaminants into Silver Creek;
- o Identify source material contributing to metals contamination in Silver Creek;
- o Measure the distance from the site to the point at which water is diverted from Silver Creek by the G.M. Pace ditch.

All of the aforementioned objectives were addressed during the July 18 through July 20, 1989 sampling effort and during a site visit conducted by Kevin Mackey and Robert Henry of E & E FIT on March 9, 1989.

3.0 BACKGROUND

3.1 LOCATION AND SITE DESCRIPTION

Richardson Flat Tailings lies within the northwest quarter of Section 1 and the northeast quarter of Section 2, Township 2 South, Range 4 East, Salt Lake Meridian, in Summit County, Utah. The tailings cover an area of approximately 160 acres on a topographic depression located one and one-half miles northeast of the town of Park City (Figures 1 and 2).

The mill tailings at Richardson Flat came from the Keetley Ontario Mine and other metal mining operations currently owned by United Park City Mines (UPCM). The most recent use of the area for tailings disposal was from 1975 to 1981. During that time UPCM had all its mining properties leased to either Park City Ventures or Noranda Mining, Inc. who constructed and operated milling facilities on UPCM properties. In May of 1974, the Utah Division of Health - Water Pollution Committee approved plans by Park City Ventures to construct an embankment, dikes and a diversion ditch to contain mill tailings deposited on Richardson Flat.

3.2 PREVIOUS WORK

The original FIT site inspection at Richardson Flat Tailings was conducted during the summer of 1985. One background monitoring well was installed by the FIT as part of the investigation. The background well and two existing UPCM wells located at the base of the dam were sampled. In addition, six surface water samples, one surface soil sample, two subsurface soil samples, four surface tailings samples and four subsurface tailings samples were collected during the 1985 sampling effort. Findings of the original site inspection are discussed in the Report of Sampling Activities (TDD R8-8505-27) and the Analytical Results Report (TDD R8-8508-07).

In July, 1986 the FIT conducted high-volume air sampling at the site. A report of air sampling activities (TDD R8-8605-12) and an analytical results report for air sampling (TDD R8-8608-05) provide details of field work and data results.

The FIT submitted a Hazard Ranking System (HRS) package for Richardson Flat Tailings on September 3, 1987. Based on documented observed releases of inorganic contaminants to surface water and air, the site received an overall migration score exceeding the 28.50 threshold value required for nomination to the National Priorities List (NPL). EPA proposed Richardson Flat Tailings to the NPL on June 14, 1988.

3.3 SITE GEOLOGY, HYDROGEOLOGY AND HYDROLOGY

3.3.1 Geology

Richardson Flat Tailings lies within a broad, gently rolling flat north of Park City, identified as Parleys Park (Figure 1). Over half of the total area (approximately 35 square miles) of Parleys Park is underlain by unconsolidated deposits of a poorly sorted mixture of clay to cobble size material. The unconsolidated deposits, which are saturated to within a few feet of the ground surface, occur primarily

along Silver and East Canyon Creeks and in the flats northwest of Quarry Mountain. The rest of the park is underlain by consolidated rocks including volcanics of Tertiary origin and Knight Conglomerate (Baker 1970).

3.3.2 Hydrogeology

The water sources for wells in the Heber-Kamas-Park City area are primarily consolidated rocks in the mountains and unconsolidated alluvial fill in the valleys. Few wells exist within Parleys Park, so the unconfined aquifer characteristics in the area are not well understood. There appear to be no well-defined beds of material of very high or very low permeability and no indications of the existence of artesian conditions. The average saturated thickness of the unconfined aquifer is broadly estimated to be about 40 feet.

The general ground water flow direction corresponds with the regional surface water flow directions. Recharge to ground water in the unconsolidated deposits in Parleys Park comes from direct infiltration of precipitation, runoff from the mountains and secondarily from subsurface inflow through consolidated rocks (Baker 1970).

3.3.3 Hydrology

Parleys Park is drained by East Canyon Creek and Silver Creek, both tributaries to the Weber River. Silver Creek which flows in a northerly direction west of and near the northern extension of Richardson Flat Tailings, has been channelized for irrigation purposes both upstream of and downstream from the tailings. The nearest diversion from Silver Creek downstream of the tailings is the G.M. Pace Ditch used for flood irrigation of alfalfa fields and pasture. The confluence of Silver Creek and the G.M. Pace Ditch is 2340 feet from the north side of U.S. Route 40, as measured along the course of Silver Creek.

A diversion ditch was constructed as part of the effort by Park City Ventures to contain tailings material deposited on Richardson Flat. Construction of the diversion ditch has altered the drainage pattern as depicted on the 1955 USGS topographic map (Figure 2). The diversion ditch originates east of the tailings and terminates in the marshy area near the embankment at the northwest portion of the tailings. Figures 3, 4, 5 and 6 depict the course of the diversion ditch as viewed on an oblique aerial photograph provided by EPA Environmental Monitoring Systems Laboratory (EMSL), dated June 1984.

Normal annual total precipitation for Richardson Flat is reported between 16 and 20 inches (Baker 1970). The one-year 24-hour rainfall for the area is 1.25 inches (U.S. Dept. of Commerce 1963).

4.0 SAMPLING ACTIVITIES

4.1 SAMPLE COLLECTION

FIT sampling activities at the Richardson Flat Tailings began on Tuesday, July 18, 1989 and continued through July 20, 1989. The sampling team consisted of Kevin Mackey, project officer, Steve Yarbrough, site safety officer and Dan Kenney, sampler.

FIT sampling activities were observed by UPCM personnel Kerry Gee and Ed Osika and consultant Bill Bullock of MSE, Inc. of Butte, Montana. The FIT provided split samples to UPCM personnel for each sample FIT collected. Each split was treated in an identical manner to those samples FIT submitted for CLP analysis.

Samples were collected in a manner which took into account drainage patterns throughout the Richardson Flat area. The FIT collected samples in order to assess possible migration of contaminants offsite into Silver Creek and determine the presence of contaminants in drainage areas. Additional samples were taken from two possible seep locations at the base of the tailings dam in order to assess the likelihood of contaminant migration via seeps and springs from the tailings pond area.

Three tailings samples were collected from the area south of the diversion ditch to characterize the surficial material as a potential source of contamination. According to Summit County ownership plat maps, the property on which these "unimpounded" tailings lie is owned by United Park City Mines.

Two tailings samples were collected from the "floodplain tailings" located on the opposite side of Silver Creek from the Richardson Flat impoundment. There is no containment feature associated with these areas and the tailings material could easily be washed into Silver Creek during storm events. According to plat maps obtained from the Summit County Assessor's office, these floodplain tailings are on land which is currently owned by the U.S. Department of Transportation.

The FIT collected samples from the diversion ditch associated with the tailings impoundment. These samples were taken in such a manner as to determine availability of contaminated material for transport offsite via the diversion ditch structure. In addition, these samples will help the FIT assess the integrity of runoff control structures onsite.

4.1.1 Tailings Samples

The FIT collected a total of five tailings samples from various locations throughout the area, as illustrated in Figure 3. These samples included:

- RFT-TA-1 Eastern end of tailings between access road and diversion ditch.
- RFT-TA-2 Southern end of tailings between Union Pacific Railroad tracks and diversion ditch.
- RFT-TA-3 Southwestern edge of tailings between Union Pacific Railroad tracks and diversion ditch.

- RFT-TA-4 Floodplain tailings located on the west side of Silver Creek.
- RFT-TA-5 Downgradient-most sample along the floodplain tailings near Silver Creek.

All tailings samples were collected using a plastic scoop or a decontaminated stainless steel spoon. The FIT composited samples on a plastic sheet prior to placing them in the appropriate sample containers.

4.1.2 Surface Water Samples

The FIT collected 12 surface water samples during the course of this investigation. Two sample aliquots were collected at each station. One sample (designated by the station location number followed by an "A" designator) was filtered with a 0.45 micron filter and a barrel filter prior to preservation with nitric acid to a pH <2. The second aliquot (designated by location number followed by a "B" qualifier) was preserved in the same manner without filtering. These samples were collected from Silver Creek west of the tailings pond, from the diversion ditch and from the marshy area located downgradient of the diversion ditch at the base of the tailings dam. The FIT collected one additional sample from the Pace Homer irrigation ditch which discharges into Silver Creek upgradient of the tailings impoundment. Sample locations are shown in Figure 3. Specifically, the samples included:

- RFT-SW-1 Background sample collected from the Pace Homer Ditch.
- RFT-SW-2 Sample collected from Silver Creek near the floodplain tailings.
- RFT-SW-3 Additional sample collected from Silver Creek near floodplain tailings.

- RFT-SW-4 Upgradient sample in runoff diversion ditch.
- RFT-SW-5 Samples collected from the diversion ditch at possible point of tailings entry.
- RFT-SW-6 Sample collected from point of diversion ditch discharge into marshy area.
- RFT-SW-7 Sample collected from the marshy area upgradient of its confluence with Silver Creek.
- RFT-SW-8 Sample collected from the point where Silver Creek enters marshy area.
- RFT-SW-9 Sample collected at culvert area where Silver Creek and marshy area drain under U.S. Route 40.
- RFT-SW-10 Downgradient sample collected from Silver Creek 800 feet upstream of the G.M. Pace irrigation diversion point.
- RFT-SW-16 Background surface water sample collected from Silver Creek downstream from the confluence of Pace Homer Ditch and Silver Creek.
- RFT-SW-17 Background surface water sample collected from Silver Creek approximately 20 feet upstream of the confluence of the Pace Homer Ditch and Silver Creek.

Heavy construction activity upgradient of surface water sample locations RFT-SW-2 and RFT-SW-3 resulted in highly turbid water at the time of sampling. The turbidity in the surface water was caused by heavy machinery moving through Silver Creek and disturbing streambed material.

4.1.3 Sediment Sample Collection

Initially, the FIT proposed screening sediment samples using FASP XRF analysis for metal contaminant detection. However, during the sampling period the FIT XRF experienced operating problems and was not available to perform the analysis. The FIT opted to send a single sediment sample from each sample location to the CLP laboratory for sieving and analysis.

The FIT collected sediment samples in conjunction with each surface water sample. Each sediment sample was collected immediately following surface water sample collection. Each sample was collected using a plastic scoop or a decontaminated stainless steel spoon. The FIT composited each sediment sample on a plastic sheet prior to placing the sample in the appropriate sample container.

4.1.4 Opportunity Samples

After performing a site reconnaissance the FIT selected two locations for opportunity sample collection. Additional surface water samples (RFT-OPW-1A and RFT-OPW-1B) and a sediment sample (RFT-OSE-1) were collected at the base of the tailings dam from a ponded seep area topographically elevated above and disjunct from the marshy area. A second opportunity sediment sample (RFT-OSE-2) was collected from a small seep area located approximately 50 feet northeast of the ponded seep area, along the face of the tailings dam (Figure 3). Flow in this seep area was insufficient for surface water sample collection. Surface water sample RFT-OPW-1A was filtered prior to preservation with nitric acid to a pH <2.

4.2 SAMPLE SHIPPING

Samples collected during this effort were shipped on July 20, 1989 to the following Contract Laboratory Program (CLP) laboratories for analysis. Samples of tailings and surface water were shipped as low hazard environmental samples to Keystone Environmental Resources in

Houston, Texas for total metals analysis under Regular Analytical Services case number 12334. However, due to contractual difficulties Keystone Environmental performed only mercury analysis on these samples. Under the direction of the Sample Management Office (SMO) these samples were shipped by Keystone Environmental to Silver Valley Laboratory in Kellogg, Idaho for the remainder of the analyses. Sediment samples were shipped to Silver Valley Laboratory in Kellogg, Idaho under Special Analytical Service case number 4725H. These samples were sieved in an 80 mesh sieve in order to remove large gravel and organic matter prior to analysis for total metals.

5.0 QUALITY CONTROL

The FIT closely adhered to quality control procedures during the sampling activity as described in the Sampling Plan and in SOP III-2, Chapter 6.

5.1 INSTRUMENT CALIBRATION

Instruments utilized on this SI were calibrated by FIT members in the field. An Orion pH meter and a specific conductivity meter were calibrated daily and used at each surface water sample collection point. In addition, pH paper was used to determine tailings and sediment pH at each sample location. Surface water field data are presented in Table 1. Sediment and tailings field data are presented in Table 2 of this report. Daily instrument calibrations can be found in the Richardson Flat logbook (TDD F08-8903-06).

5.2 SAMPLE CONTAINERS

All sample containers were obtained though the Sample Management Office (SMO) Bottle Repository. A rinsate blank was collected for each day of sampling and submitted to the Contract Laboratory Program (CLP) laboratory to assess quality control (quality assurance on equipment decontamination and field handling).

5.3 BACKGROUND SAMPLES

The FIT collected background samples for both the Silver Creek and diversion ditch drainages. Upgradient surface water and sediment samples RFT-SW-1A, RFT-SW-1B and RFT-SE-1 were collected from the Pace Homer Ditch (an irrigation ditch which discharges into Silver Creek upgradient of the floodplain tailings area). Additional surface water and sediment samples RFT-SW/SE-16 and RFT-SW/SE-17 were collected on Silver Creek upgradient of the floodplain tailings. Samples RFT-SW/SE-16 and RFT-SW/SE-17 were collected downgradient from and upgradient of the confluence of the irrigation ditch with Silver Creek, respectively.

An upgradient surface water and sediment sample (RFT-SW/SE-4) was collected from the eastern end of the runoff diversion ditch which conveys runoff from the surrounding hills near the tailings pond (Figure 3).

5.4 BLANK SAMPLES

The FIT prepared a total of three blanks for this sampling effort. RFT-SW-12A, RFT-SW-12B, RFT-SW-15A, RFT-SW-15B, RFT-SW-18A and RFT-SW-18B were field rinsate blanks (prepared to check decontamination of sampling equipment). Blank samples with an "A" designator were passed through the barrel filtering device.

5.5 DUPLICATE SAMPLES

Samples RFT-SW-11A and RFT-SW-11B were collected as a duplicate of RFT-SW-2A and RFT-SW-2B. These samples provide verification of laboratory accuracy.

5.6 DECONTAMINATION PROCEDURES

The FIT followed decontamination procedures as set forth in SOP III-2, Chapter 11 Equipment Decontamination Procedures. This procedure

involved the following steps: a tap water wash, soapy water wash, triple deionized water rinse and air drying.

5.7 DOCUMENTATION

Following sample collection, all samples were handled in strict accordance with chain of custody protocol prescribed by the <u>NEIC</u>

<u>Procedures Manual for the Evidence Audit of Enforcement Investigation by Contractor Evidence Audit Teams, April 1984 (EPA-330/9-81-003R).</u>

Appendix A of this report includes the sample identification numbers, sample tag numbers, traffic report numbers and chain of custody numbers. Copies of traffic reports, chain of custody records and pertinent airbills are available in TDD file F08-8903-06. The Richardson Flat logbook has a complete record of all documentation information (TDD F08-8903-06).

5.8 QUALITY ASSURANCE REVIEW

The inorganic data packages were examined thoroughly by FIT chemists for compliance using EPA Functional Guidelines for Reviewing Inorganic Data and the approved Region VIII FIT CLP Quality Assurance Standard Operating Procedures (SOP). The quality assurance reports and data sheets are attached as Appendix C. The data packages were judged acceptable overall, with qualifications as follows.

5.8.1 Sediment Samples

Spike recoveries were low for antimony and thallium indicating positive results for these elements are biased low and are flagged "j", estimated. Selenium recoveries were unacceptably low and positive values are flagged "j" and undetected values are rejected, "r". Thallium and selenium data were also flagged "j" for below criteria correlation in method of standard additions. Cadmium data were flagged "j", estimated, due to percent difference in serial dilution results.

5.8.2 Water And Tailings Samples

Samples were transferred from one CLP laboratory to another by the Sample Management Office. Recoveries for thallium and selenium were low and were flagged "[]" as estimated or "u" as undetected in surface water samples. Thallium results for tailings samples were flagged "j" or "[]" indicating the value is estimated due to minor quality control discrepancies, or the compound was detected below the contract required detection limit (CRDL). Lead results were flagged "j" due to duplicate results. Arsenic data were flagged "j", estimated data, due to poor correlation coefficients for RFT-SW-5A, RFT-SW-5B and RFT-SW-10B. Arsenic and zinc solid sample results were flagged "j" due to high serial dilution results. Field duplicates showed good relative agreement. Field blanks were free of contamination above contract detection limits except that arsenic in RFT-SW-12B was detected at 12 µg/1.

All arsenic and lead data are included in the discussion of analytical results in Section 6.1 and in Figures 4, 5 and 6 of this report. Refer to Tables 3, 4 and 5 for appropriate qualifications of data. Other analytical results discussed in Section 6.1 include those data which are not qualified and those data qualified as estimated or at a concentration greater than five times the quantity found in the blank.

6.0 RESULTS

Results of the supplemental site inspection are focused entirely on addressing issues associated with contaminant migration via the surface water route. Discussions of sample analytical data and field observations follow.

6.1 ANALYTICAL RESULTS

Results of the inorganic analysis of samples collected at Richardson Flat Tailings and the surrounding area are shown in Tables 3, 4 and 5. The sampling locations and the concentrations of arsenic and lead at each sample location are depicted in Figures 3 through 6. Each figure gives relative concentrations of contaminants for each medium sampled (i.e. Figure 4 contains lead and arsenic concentrations for tailings samples. Figure 5 contains lead and arsenic concentrations for surface water samples. Figure 6 contains lead and arsenic concentrations for sediment samples).

The following is a discussion of analytical results for each medium sampled.

6.1.1 Tailings Samples

Three tailings samples collected from south and southeast of the diversion ditch showed fairly constant concentrations of lead and arsenic. In particular, arsenic concentrations in tailings samples were relatively constant at approximately 200 mg/kg while lead concentrations were slightly more variable (ranging from 2580 mg/kg to 4520 mg/kg). Notable concentrations of cadmium (ranging from 21.1 to 95.9 mg/kg), copper (ranging from 149 to 336 mg/kg), mercury (ranging from 0.88 to 1.3 mg/kg), silver (ranging from 12.6 to 22.1 mg/kg) and zinc (ranging from 3220 to 14,100 mg/kg) were detected in these tailings samples as well.

Samples collected from the floodplain tailings (RFT-TA-4 and RFT-TA-5) exhibited a higher degree of variability. Arsenic concentrations in sample RFT-TA-4 were 259 mg/kg while sample RFT-TA-5 had an arsenic concentration of 175 mg/kg. Lead concentrations were also highly variable with sample RFT-TA-5 containing 31,600 mg/kg of lead while RFT-TA-4 had a concentration of 9300 mg/kg. Concentrations of cadmium (117 and 250 mg/kg), mercury (8.2 and 7.6 mg/kg), silver (62.8 and 115 mg/kg) and zinc (16,200 and 33,800 mg/kg) were notably higher in the floodplain tailings than in tailings samples collected south of the diversion ditch.

6.1.2 Surface Water Samples

Surface water samples were collected to assess the relationship of the site to contaminant distribution in Silver Creek and in the diversion ditch. For each surface water sample location, both a filtered sample and an unfiltered sample were submitted for analysis. As anticipated, the unfiltered surface water samples showed higher levels of contamination indicating a majority of the contaminants exist as suspended solids. The filtered and the unfiltered surface water samples exhibit similar trends in relative contaminant magnitude and in specific contaminants detected (Table 5). The following discussion focuses on results of unfiltered surface water samples. Figure 5 illustrates relative lead and arsenic concentrations in unfiltered surface water samples.

Background concentrations of metals in Silver Creek and the Pace Homer Ditch upgradient of their confluence were relatively low. Specifically, RFT-SW-1B in the Pace Homer Ditch had 0.93 µg/l of lead and 7.7 µg/l of arsenic. Sample RFT-SW-17B, collected from Silver Creek upgradient of the Pace Homer confluence, contained 0.9 µg/l of lead and 2.3 µg/l of arsenic. Background surface water sample RFT-SW-16B, collected from Silver Creek downgradient from the Pace Homer confluence contained 25.2 µg/l of lead and 5.6 µg/l of arsenic.

Surface water samples collected from Silver Creek in the vicinity of the floodplain tailings contained very high concentrations of lead and arsenic. Analytical results of RFT-SW-2B indicated the presence of lead at 20,000 µg/l and arsenic at 619 µg/l. Sample RFT-SW-3B contained 1100 µg/l of lead and 41.9 µg/l of arsenic. Also notable in sample RFT-SW-2B were high levels of cadmium (137 µg/l), chromium (72.2 µg/l), copper (1390 µg/l), mercury (11.50 µg/l), silver (131 µg/l) and zinc (19,300 µg/l). Further downstream as Silver Creek meanders through the marshy area, data from sample RFT-SW-8B indicated reduced concentrations of lead (36.6 µg/l) and arsenic (8.4 µg/l). Sample RFT-SW-9B, collected from Silver Creek on the south side of the U.S. Route 40 culvert contained 122 µg/l of lead and 12.2 µg/l of arsenic. Concentrations of

lead (35.8 μ g/l) in RFT-SW-10B drop as the course of Silver Creek moves further from the site.

The background diversion ditch sample (RFT-SW-4B), collected near the point of origin of that drainage was highly contaminated. Lead was detected at 22,100 μ g/l and arsenic was detected at 2326 μ g/l. High concentrations of cadmium (289 μ g/l), chromium (50.2 μ g/l), copper (1540 μ g/l), mercury (8.0 μ g/l), silver (201 μ g/l) and zinc (49,100 μ g/l) were also detected in RFT-SW-4B.

Sample RFT-SW-5B, collected from the diversion ditch midway through the tailings contained 24.9 μ g/l of lead and 17.4 μ g/l of arsenic. Surface water collected from the point at which the diversion ditch enters the marshy area (RFT-SW-6B) contained greatly reduced concentrations of lead (1.9 μ g/l) and arsenic (3.9 μ g/l). RFT-SW-7B, collected in the center of the marshy area, contained 131 μ g/l of lead and 9.4 μ g/l of arsenic.

Opportunity surface water sample RFT-OPW-1B, collected from a seep area at the base of the tailings embankment contained $68.2~\mu g/l$ of lead, $33.1~\mu g/l$ of arsenic and $759~\mu g/l$ of zinc. Mercury was not detected in this sample.

6.1.3 Sediment Samples

Sediment samples were collected from all surface water sampling locations throughout the study area. Two additional sediment samples (RFT-OSE-1 and RFT-OSE-2) were collected from seep areas at the toe of the tailings embankment. Flow in the area of RFT-OSE-2 was minimal at the time of sampling, precluding collection of a corresponding surface water sample. Analytical results of sediment samples are presented in Table 4. Figure 6 illustrates relative lead and arsenic concentrations in sediment samples.

Analytical results of background sediments collected from the Pace Homer Ditch and Silver Creek indicated the presence of elevated concentrations of arsenic and lead upgradient of the influence of the floodplain tailings and the impoundment. Sample RFT-SE-1, collected in the Pace Homer Ditch, contained 1790 mg/kg of lead and 83.2 mg/kg of arsenic. Sediment sample RFT-SE-17, collected from Silver Creek upgradient of the Pace Homer Ditch confluence, contained 12,200 mg/kg of lead and 555 mg/kg of arsenic. Also notable in RFT-SE-17 were relatively high concentrations of cadmium (113 mg/kg), silver (39.8 mg/kg) and zinc (17,500 mg/kg). Sample RFT-SE-16, collected downgradient from the Pace Homer Ditch confluence contained 4430 mg/kg of lead and 211 mg/kg of arsenic.

Sediment samples collected in close proximity to the floodplain tailings (RFT-SE-2 and RFT-SE-3) contained high levels of arsenic (590 and 427 mg/kg), cadmium (91.4 and 82.0 mg/kg), lead (14,200 and 9880 mg/kg) and mercury (4.9 and 6.0 mg/kg).

Sediment sample RFT-SE-8, collected from Silver Creek within the marshy area contained 348 mg/kg arsenic, 82.3 mg/kg cadmium and 3510 mg/kg lead. Analytical data for Silver Creek sediment sample RFT-SE-9, collected at the U.S. Route 40 culvert, indicated contaminants present in the following concentrations: 295 mg/kg arsenic, 90.2 mg/kg cadmium, 6970 mg/kg lead and 5.0 mg/kg mercury. Concentrations of all contaminants including arsenic (5.4 mg/kg) and lead (108 mg/kg) were significantly reduced in sediment sample RFT-SE-10, collected from Silver Creek a few hundred feet downstream from the U.S. Route 40 culvert.

The background diversion ditch sediment sample (RFT-SE-4 was significantly contaminated with arsenic (776 mg/kg), cadmium (100 mg/kg), lead (13,600 mg/kg) and mercury (5.5 mg/kg). Arsenic, lead and mercury data for sediments collected from the diversion ditch midway through the tailings (RFT-SE-5) and at the point of discharge to the marshy area (RFT-SE-6) indicate a reduction in concentrations of these elements as compared to sample RFT-SE-4. Cadmium concentrations were not reduced, however, as RFT-SE-5 contained 149 mg/kg and RFT-SE-6 contained 62.3 mg/kg. Sample RFT-SE-7, collected in the center of the

marshy area, contained 198 mg/kg arsenic, 102 mg/kg cadmium and 3250 mg/kg lead.

Opportunity sediment samples were collected from two separate seep areas discovered during site reconnaissance. Sample RFT-OSE-1, collected from a ponded area at the base of the embankment, exhibited significant concentrations of arsenic (751 mg/kg), cadmium (185 mg/kg), lead (12,500 mg/kg), silver (60.6 mg/kg) and zinc (24,000 mg/kg). Sample RFT-OSE-2, obtained from a seep area along the face of the embankment, contained 839 mg/kg of arsenic, 131 mg/kg cadmium, 6900 mg/kg of lead and 20,000 mg/kg of zinc.

6.2 FIELD OBSERVATIONS

Discussed below are field observations made by the FIT during the July 1989 sampling effort, during a previous site visit in March 1989 and during a personal interview with a local rancher conducted in December 1989.

6.2.1 Source Data

Tailings material present on the south side of the diversion ditch was virtually indistinguishable in appearance from tailings material within the "impoundment". Tailings on both sides of the ditch were noted as light gray in color as shown in Photo 1 (Appendix B).

Floodplain tailings exhibited a different appearance than the impoundment tailings and the tailings located south of the diversion ditch. The floodplain tailings were noted as more orange in color (Photos 5 and 6, Appendix B), indicative of iron oxidation. The pH measurements of floodplain tailings samples RFT-TA-4 and RFT-TA-5 indicated highly acidic surface conditions (pH 2).

6.2.2 Pathway Data

No effective barrier to erosional transport of tailings material into the diversion ditch was observed. The ditch appeared to have been constructed through deposited tailings.

Although the diversion ditch contained standing water along much of its course, it may be an overland conduit of contamination from the tailings into the Silver Creek drainage during events of high precipitation. The diversion ditch terminates in the marshy area as depicted in Figure 7.

Floodplain tailings were noted as highly susceptible to erosional transport into Silver Creek, with no visible containment structure present.

Due to heavy construction activities upstream, Silver Creek was notably turbid along its course where RFT-SW-2 and RFT-SW-3 were collected. Turbidity may have contributed to excessive contaminant concentrations detected in these surface water samples.

After a thorough reconnaissance, two seep areas were located along the tailings embankment. One seep was found in an isolated pond area at the base of the embankment. The second seep area was located approximately 50 feet north of the pond area along the face of the embankment. Opportunity sediment samples were collected from both seep locations and an opportunity surface water sample was collected from the ponded area.

The facility has an average slope of less than three percent. The intervening terrain between seep samples RFT-OPW-1/RFT-OSE-1 and the marshy area was observed to be between three to five percent. The intervening terrain between seep samples RFT-OSE-2 and the marshy area was observed to be between five to eight percent.

The likely course that runoff can be expected to follow from seep areas to the marshy area is depicted on Figure 7. The distance from the RFT-OPW-1/RFT-OSE-1 sample location (ponded seep area) to the marshy area was approximately 150 feet at the time of sampling. The distance from the RFT-OSE-2 sample location to the marshy area was approximately 200 feet at the time of sampling.

6.2.3 Target Data

Probable points of entry of seep contaminants into a surface water body (i.e. the marshy area) are illustrated on Figure 7. The distance measured across the marshy area from the nearest probable point of entry to Silver Creek at the U.S. Route 40 culvert is approximately 325 feet.

The nearest point of diversion of surface water from Silver Creek downgradient of the site is the G.M. Pace Ditch, used to irrigate alfalfa fields and pasture. The point at which the G.M. Pace Ditch diverts water from Silver Creek was measured as 2340 feet from the U.S. Route 40 culvert along the course of Silver Creek.

Mr. Standley Pace, in an interview conducted by FIT member Kevin Mackey in December 1989, stated that he currently irrigates about 115 acres of cow pasture and alfalfa fields with water from the G.M. Pace Ditch. Mr. Pace's cousin irrigates an additional 115 acres for similar purposes using water diverted by the G.M. Pace Ditch. Another local rancher, Mr. James Gilmore, was identified by Mr. Pace as a user of the ditch.

Mr. Gilmore stated during a December 1989 telephone conversation that he currently irrigates between 95 and 110 acres of alfalfa fields and sheep pasture using water from the G.M. Pace Ditch. Records of communication with Mr. Pace and Mr. Gilmore are provided in Appendix D.

7.0 CONCLUSIONS

Objectives of the supplemental site inspection for Richardson Flat Tailings have been accomplished as a result of follow-up sampling and field activities.

7.1 SURFACE HYDROLOGY

Surface water drainage patterns throughout the site area have been defined. The diversion ditch, which originates on the hill near the southeastern extension of the impounded tailings, cuts through tailings material throughout most of its course and terminates in the marshy area at the base of the tailings embankment (Figure 3).

Silver Creek flows parallel to the Union Pacific Railroad tracks for most of its course between the east/west access road and U.S. Route 40. About 250 feet south of U.S. Route 40, Silver Creek flows beneath the Union Pacific Railroad trestle where it meanders through a portion of the marshy area near the base of the tailings embankment. Silver Creek flows beneath U.S. Route 40 via a culvert, then flows in a northwest direction into the Weber River drainage (Figures 1 and 3).

The likely courses of runoff from seep locations into the marshy area are depicted on Figure 7.

7.2 OBSERVED RELEASE

Analytical results of surface water and sediment samples collected from Silver Creek and the diversion ditch do not support an observed release of contaminants to surface water. The significant contribution of contaminants to Silver Creek by the floodplain tailings and historic deposition of metal-bearing material into the streambed cannot be clearly segregated from contamination contributed by the Richardson Flat tailings.

The upgradient diversion ditch surface water and sediment samples (RFT-SW-4 and RFT-SE-4) revealed higher contaminant levels than did diversion ditch samples midway though the tailings (RFT-SW-5 and RFT-SE-5) and at the point of outflow (RFT-SW-6 and RFT-SE-6). Lower contaminant concentrations in RFT-SW-5, RFT-SE-5, RFT-SW-6 and RFT-SE-6 may result from high percentages of organic matter at these sample locations. Inability to establish clear trends of contaminant distribution in both the diversion ditch and Silver Creek drainages is probably due in part to the non-homogenous nature of tailings material deposited.

7.3 SOURCES

Source material analyzed during the course of the original site inspection and the supplemental activities include tailings within the impoundment, tailings on the south side of the diversion ditch and tailings adjacent to Silver Creek (referred to in this report as floodplain tailings). All tailings samples collected contained high concentrations of inorganic contaminants. Elemental concentrations and near neutral pH measurements of tailings samples RFT-TA-1, RFT-TA-2 and RFT-TA-3 (south side of diversion ditch) correspond closely with data for tailings samples collected from the impounded area during the original site inspection (Ecology and Environment, Inc. 1985). High concentrations of arsenic, cadmium, copper, lead, mercury, silver and zinc are associated with tailings deposited on Richarson Flat regardless of proximity to the diversion ditch.

Presence of arsenic, cadmium, lead, silver and zinc contamination in seep water and sediment samples indicate a loss of integrity in the tailings impoundment control structure. It is possible that tailings were mixed with native soil during construction of the earthen embankment, contributing to contamination of seep samples.

Analytical results of floodplain tailings indicated notably higher concentrations of cadmium, lead, mercury and zinc as compared to tailings collected from the impoundment and from the south side of the

diversion ditch. Surface water and sediment samples collected from Silver Creek in the vicinity of the floodplain tailings contained high levels of corresponding contaminants.

Background surface water and sediment samples collected from Silver Creek and the Pace Homer Ditch indicated additional sources of inorganic contamination upgradient of sources discussed in this report.

7.4 SURFACE WATER DIVERSION

The distance to the G.M. Pace Ditch from the U.S. Route 40 culvert was measured in the field and was reported as 2340 feet along the course of Silver Creek. The distance from contaminated seep sediment sample RFT-OSE-2 to the probable point of entry of contaminants into surface water is approximately 200 feet along the likely course of runoff. The distance across the marsh from the probable point of entry to Silver Creek at the U.S. Route 40 culvert is approximately 325 feet. The total distance from contamination to the nearest diversion of water from Silver Creek is therefore 2865 feet measured along the course of surface water flow.

The total number of acres irrigated by water diverted from Silver Creek via the G.M. Pace Ditch was documented as 330 (Standly Pace, 115 acres; Angus Pace 115 acres; James Gilmore, 100 acres).

7.5 SUMMARY

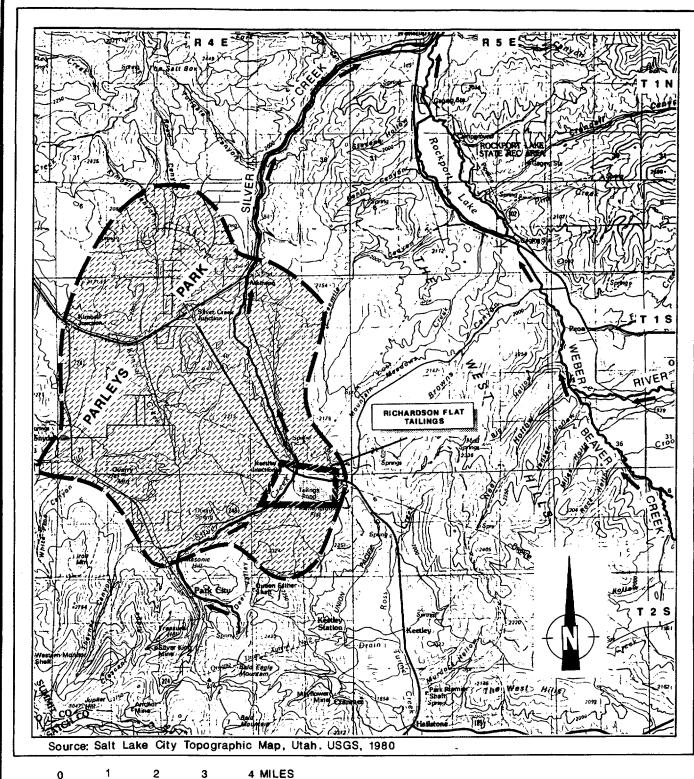
In summary, no observed release of contaminants attributable to the site has been clearly documented. Inorganic contamination is prevalent throughout the study area and additional sources of contamination other than those discussed in this report may exist.

Contaminated water and sediment samples collected at seep locations on the tailings embankment, however, demonstrate the diking is leaking and unsound. Contamination attributable to Richardson Flat tailings poses a potential threat to surface water in Silver Creek.

Within three miles downstream of documented contamination attributable to Richardson Flat Tailings, water is diverted by the G.M. Pace Ditch for crops and pasture irrigation of approximately 330 acres of land.

8.0 REFERENCES

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- Ecology and Environment, Inc., 1989, Standard Operating Procedures for FASP XRF Method--Screening for Metals in Soil/Solid Samples SOP VI-2.
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- USEPA Contract Laboratory Program, July, 1987, Statement of Work, No. 787 for Inorganics Analysis; Multimedia, Multiconcentration.
- USEPA Hazardous Site Control Division, 1985, USEPA Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis. TDD HQ-8410-01.
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4 MILES

FIELD INVESTIGATIONS OF UNCONTROLLED HAZARDOUS WASTE SITES TASK REPORT TO THE E.P.A.

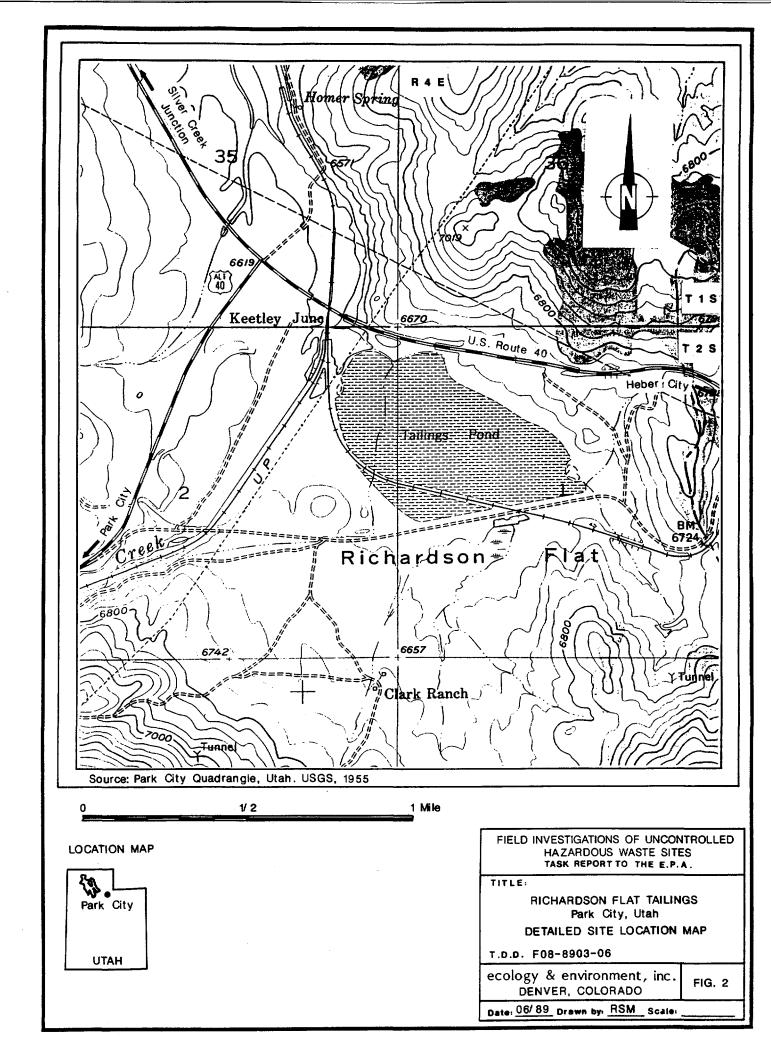
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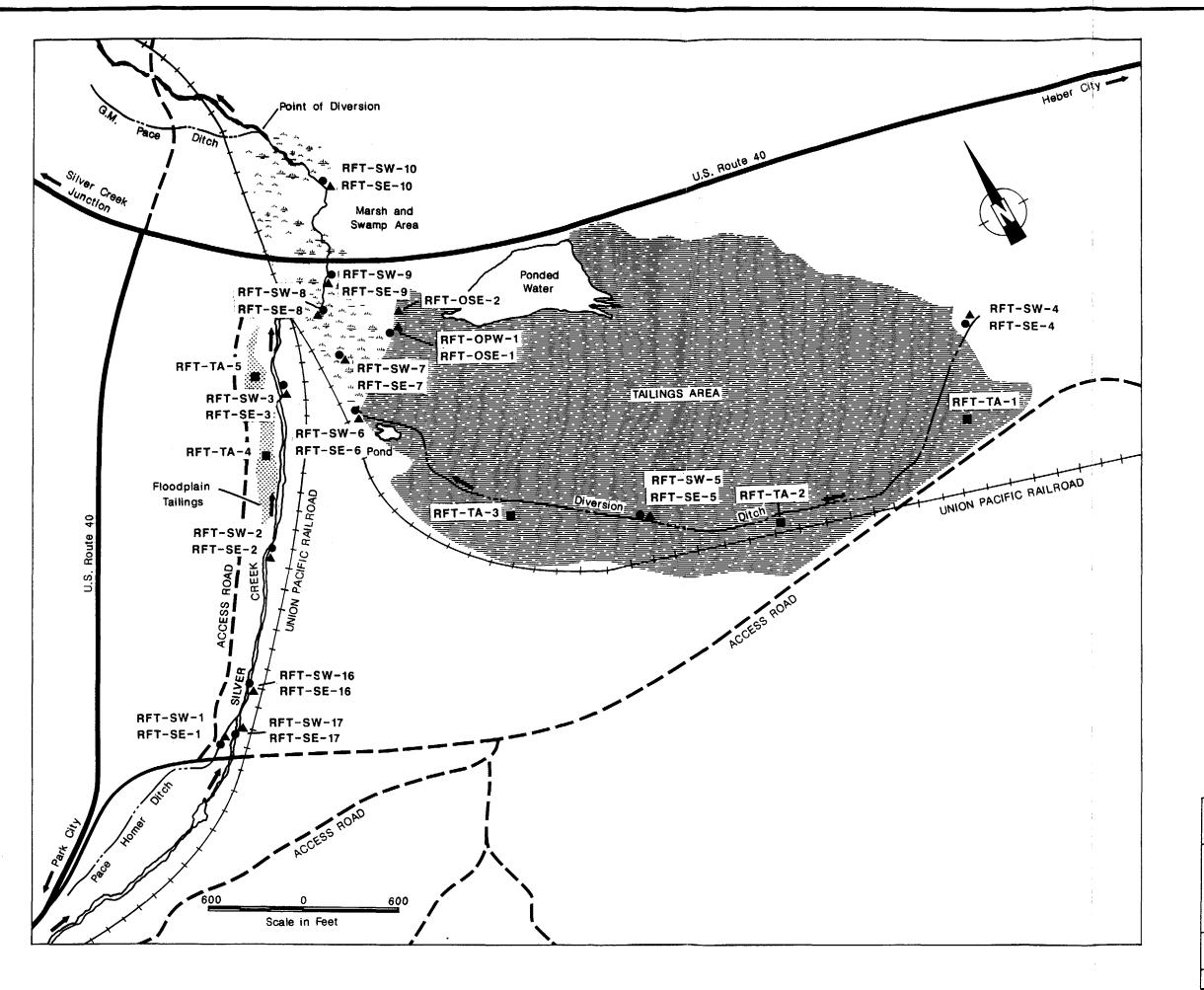
RICHARDSON FLAT TAILINGS Park City, Utah SITE LOCATION MAP

FIG. 1

T.D.D. F08-8903-06

ecology & environment, inc. DENVER, COLORADO





LEGEND

- Tailings sample
- Surface water sample
- ▲ Sediment sample

FIELD INVESTIGATIONS OF UNCONTROLLED HAZARDOUS WASTE SITES
TASK REPORT TO THE E.P.A.

TITLE:

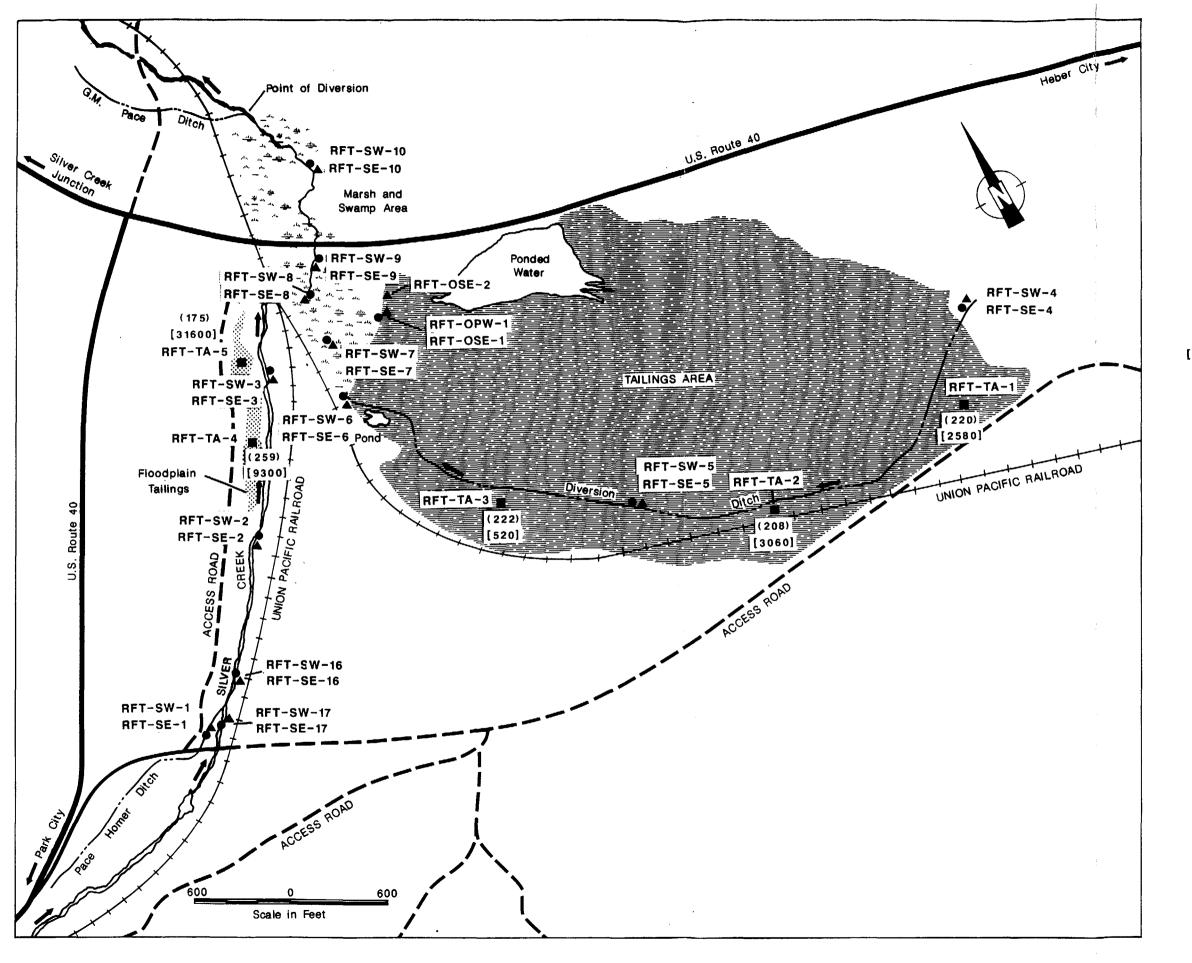
RICHARDSON FLAT TAILINGS
Park City, Utah

FIG. 3

SAMPLE LOCATION MAP

T.D.D. F08-8903-06

ecology & environment, inc.
DENVER, COLORADO



LEGEND

- Tailings sample
- Surface water sample
- Sediment sample

(259) Arsenic concentration (mg/kg)

[31600] Lead concetration (mg/kg)

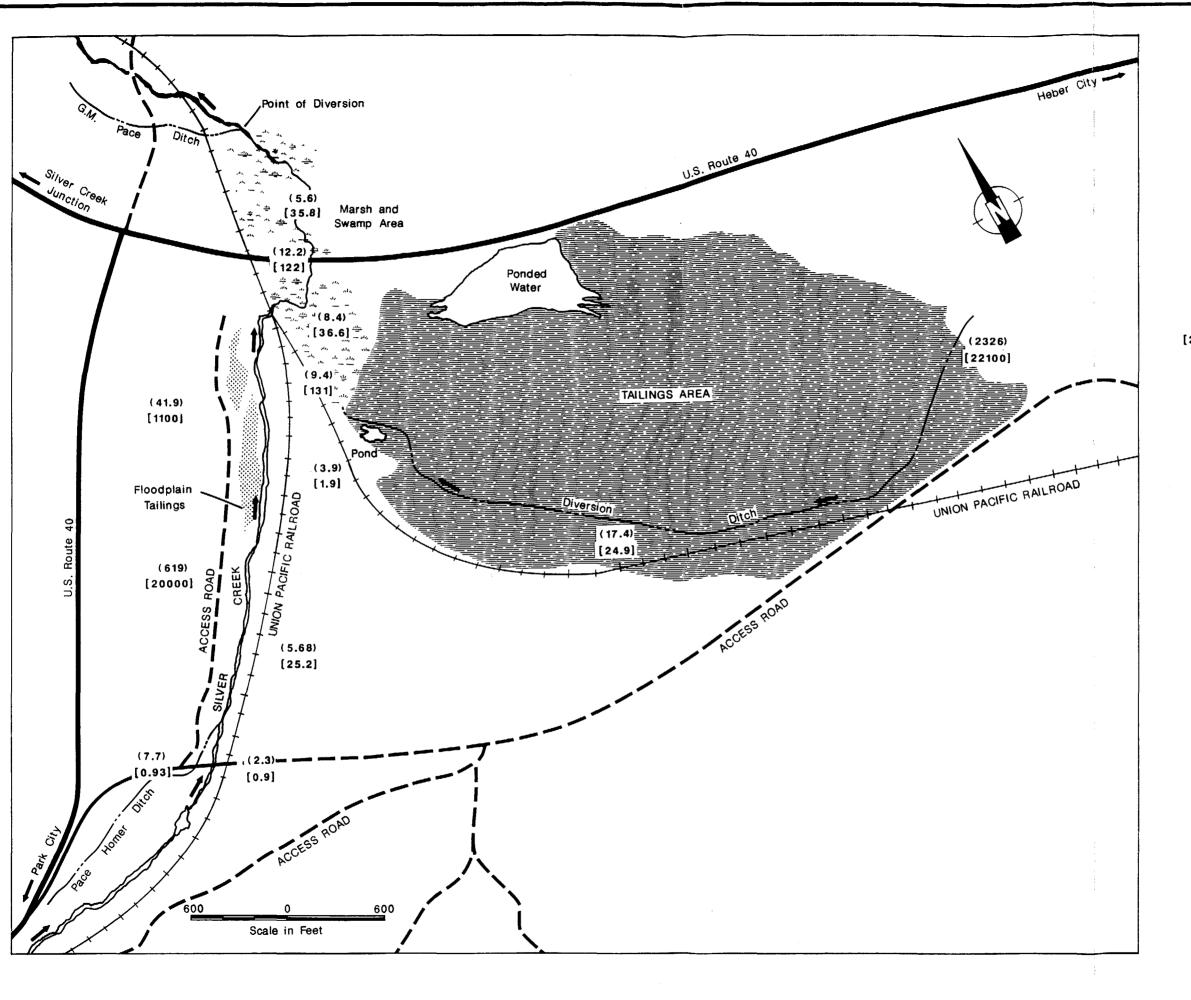
FIELD INVESTIGATIONS OF UNCONTROLLED HAZARDOUS WASTE SITES TASK REPORT TO THE E.P.A.

TITLE:

RICHARDSON FLAT TAILINGS Park City, Utah CONCENTRATIONS OF ARSENIC AND LEAD IN TAILINGS SAMPLES T.D.D. F08-8903-06

ecology & environment, inc. DENVER, COLORADO

FIG. 4



[20000] Lead concentration (ug/l)
(619) Arsenic concentration (ug/l)

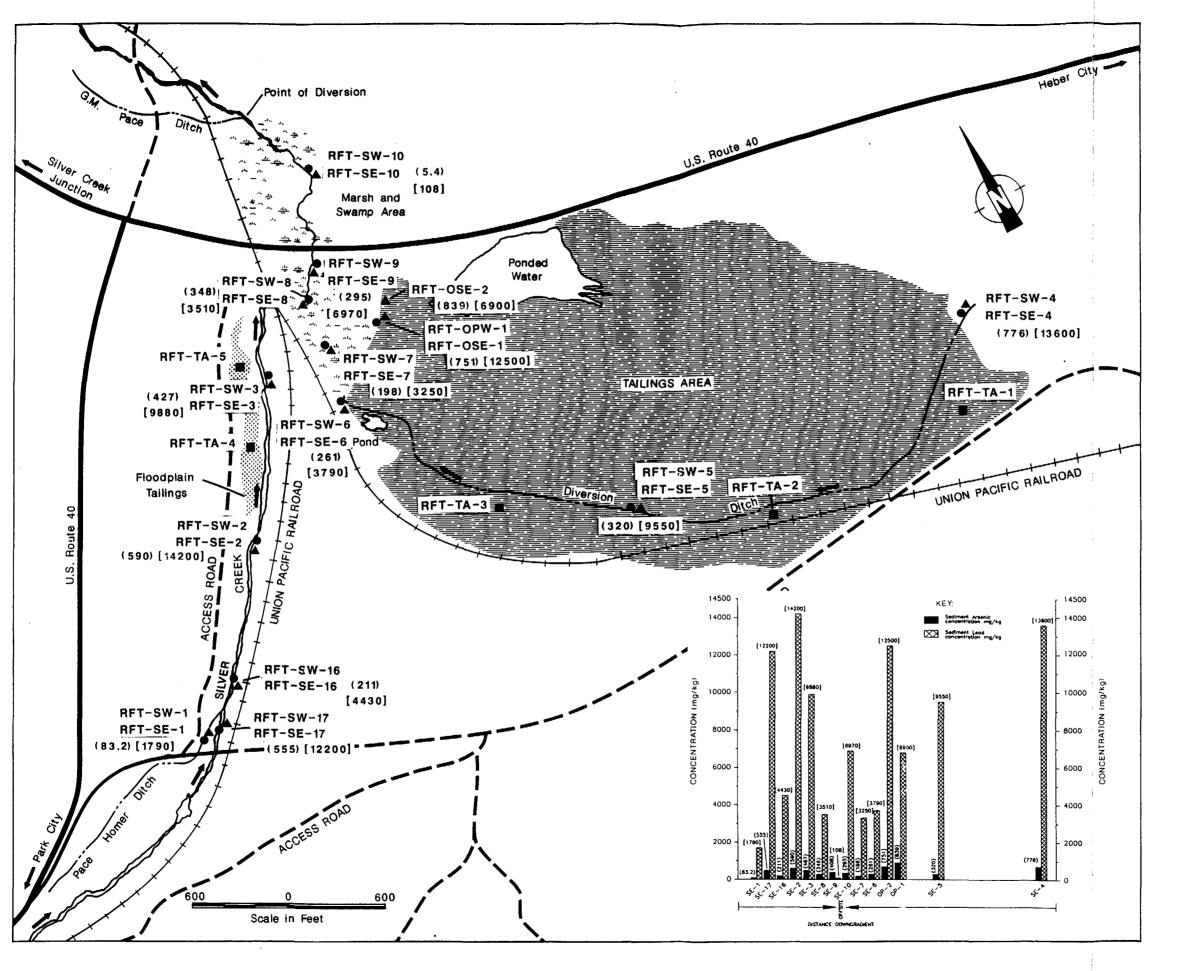
FIELD INVESTIGATIONS OF UNCONTROLLED HAZARDOUS WASTE SITES TASK REPORT TO THE E.P.A.

TITLE:

RICHARDSON FLAT TAILINGS
Park City, Utah
CONCENTRATIONS OF ARSENIC AND
LEAD IN UNFILTERED WATER SAMPLES
T.D.D. F08-8903-06

FIG. 5

ecology & environment, inc.
DENVER, COLORADO



LEGEND

- Tailings sample
- Surface water sample
- Sediment sample
- Sediment Arsenic concentrations mg/kg
- [14200] Sediment Lead concentrations mg/kg

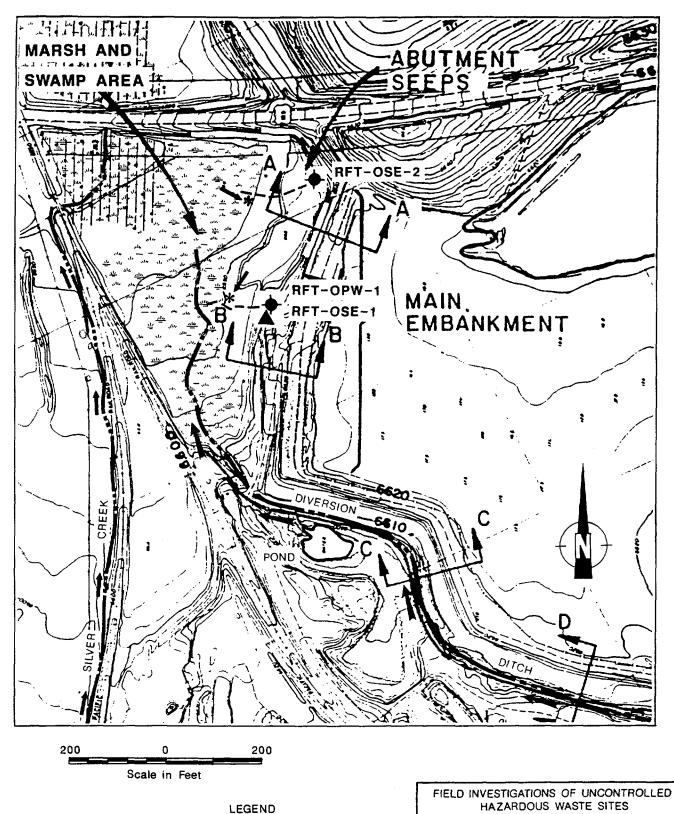
FIELD INVESTIGATIONS OF UNCONTROLLED HAZARDOUS WASTE SITES TASK REPORT TO THE E.P.A.

RICHARDSON FLAT TAILINGS Park City, Utah

FIG. 6

CONCENTRATIONS OF ARSENIC AND LEAD IN SEDIMENT SAMPLES T.D.D. F08-8903-06

ecology & environment, inc. DENVER, COLORADO



Opportunity water sample

Sediment sample

Likely course of runoff

Probable point of entry

Source: Dames & Moore Aerial Photograph Plot Plan, August 24, 1980.

HAZARDOUS WASTE SITES TASK REPORT TO THE E.P.A.

TITLE:

RICHARDSON FLAT TAILINGS Park City, Utah SURFACE HYDROLOGY MAP

FIG. 7

T.D.D. F08-8903-06

ecology & environment, inc. DENVER, COLORADO

SITE: Richardson Flat Tailings TABLE 1 SURFACE WATER FIELD DATA SHIPPING FIELD DATA COMMENTS SAMPLING SAMPLE ID. DATE DATE TIME Hq COND TEMP. C umho 620 07/19/89 1107 07/20/89 7.5 20 RFT-SW-1A & B These samples were collected in Silver Creek down-stream of construction activities. These activities resulted in highly turbed water which, in turn, may increase metals concentrations in unfiltered surface 7.3 1300 19 07/20/89 07/19/89 1040 RFT-SW-2A & B water samples RFT-SW-2B and RFT-SW-3B. 7.5 1350 18 07/20/89 RFT-SW-3A & B 07/19/89 1016 1000 14 07/20/89 7.05 RFT-SW-4A & B 07/19/89 0911 07/19/89 0854 07/20/89 7.09 1300 14 RFT-SW-5A & B RFT-SW-6A & B 07/19/89 0824 07/20/89 6.8 1600 17 RFT-SW-7A & B 07/18/89 1648 07/20/89 6.01 1500 20 07/18/89 19 1633 07/20/89 6.61 1500 RFT-SW-8A & B 1200 24 RFT-SW-9A & B 07/18/89 1345 07/20/89 7.74 RFT-SW-10A & B 07/18/89 1511 07/20/89 8.08 1200 22 07/19/89 1345 07/20/89 7.51 1200 17 KFT-OPW-1A & B

SITE: Richardson Flat Tailings TABLE 1 (Cont) SURFACE WATER FIELD DATA SAMELE ID. SAMPLING SHIPPING FIELD DATA COMMENTS DATE ed paper TIME DATE рН COND TEMP. umho C Duplicate of RFT-SW-2A & B 7.3 1300 19 RFT-SW-11A & B 07/19/89 1040 07/20/89 07/20/89 07/19/89 1437 Blank RFT-SW-15A & B 16 07/20/89 1025 07/20/89 7.15 1000 RFT-SW-16A & B 1040 07/20/89 7.0 1000 16 RFT-SW-17A & B 07/20/89 RFT-SW-18A & B 07/20/89 1100 07/20/89 Blank

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TABLE 2 SOIL AND SEDIMENT FIELD DATA SITE Richardson Flat Tailings

SAMPLE ID	SAM	PLING	SHIPPING DATE	COMMENTS
	DATE	TIME		
RFT-SE-1	07/19/89	1107	07/20/89	Dark brown material, some organic matter present
RFT-SE-2	07/19/89	1040	07/20/89	Light gray medium to fine grained sediment
RFT-SE-3	07/19/89	1016	07/20/89	Light gray medium to fine grained sediment
RFT-SE-4	07/19/89	0925	07/20/89	Dark brown to medium gray, fine grained sediment
RFT-SE-5	07/19/89	0900	07/20/89	Gray with rust color
RFT-SE-6	07/19/89	0835	07/20/89	Light gray, medium to coarse grained sediment
RFT-SE-7	07/18/89	1700	07/20/89	Dark brown sediment high in organic matter
RFT-SE-8	07/18/89	1640	07/20/89	Dark brown sediment high in organic matter
RFT-SE-9	07/18/89	1351	07/20/89	Medium gray fine grained sediment, some organic matter present
RFT-SE-10	07/18/89	1524	07/20/89	Dark brown silty clay (fine grained)
RFT-SE-16	07/20/89	1025	07/20/89	Medium gray, fine to coarse grained sediment
RFT-SE-17	07/20/89	1040	07/20/89	Medium gray, fine to coarse grained sediments
RFT-TA-1	07/18/89	1115	07/20/89	Tan or rust colored, fine sand or tailings; pH 6.5
RFT-TA-2	07/18/89	1125	07/20/89	Tan colored, fine sand or tailings; pH 6

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TABLE 2 SOIL AND SEDIMENT FIELD DATA SITE Richardson Flat Tailings

D recyaled paper	PAMI	PLING	SHIPPING DATE	COMMENTS
ed pape	DATE	TIME		
RFT-TA-3	07/18/89	1138	07/20/89	Light tan to gray material, fine texture; pH of 6
RFT-TA-4	07/18/89	1205	07/20/89	Soil pH measurements showed a pH of 2 for these tailings
RFT-TA-5	07/18/89	1217	07/20/89	Soil pH measurements showed a pH of 2
RFT-OSE-1	07/19/89	1345	07/20/89	Dark brown with decomposing organic matter; pH of 7
RFT-OSE-2	07/19/89	1500	07/20/89	Rust colored to dark brown with organic matter; pH of 7.5
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TABLE 3 INORGANIC ANALYTICAL RESULTS FOR TAILINGS SAMPLES (mg/kg) RICHARDSON FLAT TAILINGS SUMMIT COUNTY, UTAH TDD FO8-8903-06 - PAN FUT0039HDA

SAMPLE # TRAFFIC RPT # SAMPLE LOCATION	RFT-TA-1 MHL-955 EAST OF TAILINGS POND	RFT-TA-2 MHL-956 MIDDLE OF TAILINGS POND	RFT-TA-3 MHP-500 WEST OF TAILINGS POND	RFT-TA-4 MHP-501 FLOOD PLAIN TAILINGS	RFT-TA-5 MHP-502 FLOOD PLAIN TAILINGS
Aluminum	691	1040	1530	1030	240
Antimony	63.1	84.4	87.0	120	144
Arsenic	220j	208j	222j	259 j	175j
Barium	153	86.9	[32.8]	117	[39.5]
Beryllium	0.22u	0.22u	0.22u	0.27u	0.23u
Cadmium	21.1	41.2	95.9	117	250
Calcium	37000	54500	68200	5400	32800
Chromium	[2.0]	6.0	8.8	0.69u	0.59u
Cobalt	[5.5]	[2.6]	[7.4]	[3.9]	[3.2]
Copper	149	205	336	281	265
Iron	44700	36500	53400	97400	87000
Lead	2580	3060	4520	9300	31600
Magnesium	11200	18500	23000	[1140]	[142]
Manganese	1440	1740	2320	212	252
Mercury *	0.99	1.3	0.88	8.20	7.60
Nickel	8.2	9.4	[7.1]	[5.1]	[6.2]
Potassium	[255]	[496]	[827]	[1140]	[680]
Selenium	23.6	12.7	19.2	45.7	38.4
Silver	12.6	18.5	22.1	62.8	115
Sodium	[22.4]	[34.8]	[42.6]	[603]	[117]
Thallium	6.6j	3.0j	[4.2]j	[9.7]j	[6.8]j
Vanadium	[1.3]	[3.8]	[3.7]	[2.6]	0.57u
Zinc	3220	5710	14100	16200	33800

- * Results have been provided by Keystone Laboratory of Houston, Texas. The remaining results are from analyses conducted by Silver Valley Laboratories of Kellog, Idaho.
- j The associated numerical value is an estimated quantity because the amount detected is below the contract required detection limit (CRDL) or because minor quality control criteria were not met. Presence of the material is reliable.
- u The material was analyzed for, but was not detected. The associated numerical value is the estimated sample quantitation limit or CRDL.
- [] The associated numerical value is an estimated quantity because the amount detected is below the contract required detection limit (CRDL). Presence of the material is reliable. (Inorganic data only).

TABLE 4 INORGANIC ANALYTICAL RESULTS FOR SEDIMENT SAMPLES (mg/kg) RICHARDSON FLAT TAILINGS SUMMIT COUNTY, UTAH TDD FO8-8903-06 - PAN FUT0039HDA

SAMPLE # PACKING LIST # SAMPLE LOCATION	RFT-SE-1 4725H-01 BCKGRND PACE HOMER DITCH	RFT-SE-2 4725H-02 SILVER CRK NEAR FLOOD PLAIN TLGS	RFT-SE-3 4725H-03 SILVER CRK NEAR FLOOD PLAIN TLGS		RFT-SE-5 4725H-05 DIVERSION DITCH
Aluminum	18400	8620	7650	25100	2810
Antimony	19.8j	201j	114j	200j	178j
Arsenic	83.2	590	427	776	320
Barium	270	147	130	1220	134
Beryllium	1.7	[.86]	[.81]	[1.9]	[.47]
Cadmium	14.6j	91.4j	82.0j	100j	149j
Calcium	15000	25600	2610	82100	89700
Chromium	21.9	.77u	[1.0]	33.2	10.9
Cobalt	[11.4]	43.5	38.5	[10.1]	[5.3]
Copper	239	753	459	840	613
Iron	30800	181000	148000	58600	44800
Lead	1790	14200	9880	13600	9550
Magnesium	6130	9430	8480	33800	19700
Manganese	1260	1730	1630	2770	3090
Mercury	1.0	4.9	6.0	5.5	1.5
Nickel	23.5	21.5	28.8	27.0	[2.9]
Potassium	3160	[1160]	[1150]	6270	[794]
Selenium	3.1j	46.2j	42.7j	15.4j	16.1jr
Silver	9.7	47.5	30.3	86.0	60.9
Sodium	[239]	[181]	[173]	[447]	[84.6]
Thallium	[.81]j	[3.6]j	4.1j	23.2j	12.7j
Vanadium	48.7	19.0	21.2	46.5	[8.6]
Zinc	2770	15500	15100	15700	26400

- j The associated numerical value is an estimated quantity because the amount detected is below the contract required detection limit (CRDL) or because minor quality control criteria were not met. Presence of the material is reliable.
- r Quality control indicates that data is <u>not</u> usable (material may or may not be present). **DO NOT USE THIS DATA!**.
- u The material was analyzed for, but was not detected. The associated numerical value is the estimated sample quantitation limit or CRDL.
- [] The associated numerical value is an estimated quantity because the amount detected is below the contract required detection limit (CRDL). Presence of the material is reliable. (Inorganic data only).

TABLE 4 CONT. INORGANIC ANALYTICAL RESULTS FOR SEDIMENT SAMPLES (mg/kg) RICHARDSON FLAT TAILINGS SUMMIT COUNTY, UTAH TDD F08-8903-06 - PAN FUT0039HDA

SAMPLE # PACKING LIST # SAMPLE LOCATION	RFT-SE-6 4725H-06 OUT FLOW POINT FOR DIVERSION DITCH	RFT-SE-7 4725H-07 MARSHY AREA	RFT-SE-8 4725H-08 SILVER CRK DRAINAGE IN MARSH AREA	RFT-SE-9 4725H-09 SILVER CRK CULVERT NEAR ROUTE 40	RFT-SE-10 4725H-10 DNGRDNT SILVER CRK 800' UPSTRM G.M. PACE DITCH
Aluminum	11100	9710	14000	10900	20200
Antimony	40.8	37.6j	80.5j	107j	10.1uj
Arsenic	261j	198	348	295	5.4
Barium	944	384	286	229	408
Beryllium	[.85]	[1.1]	[1.5]	[1.4]	1.6
Cadmium	62.3j	102j	82.3j	90.2j	2.2j
Calcium	46900	90700	85800	38700	9640
Chromium	.71u	9.9	16.5	16.3	18.5
Cobalt	64.4	20.4	33.3	20.1	[10.9]
Copper	256	264	567	498	40.7
Iron	41400	64900	49200	68700	25500
Lead	3790	3250	3510	6970	108
Magnesium	13300	20700	18400	11100	6360
Manganese	207000	19100	14300	3070	303
Mercury	0.24	0.82	1.1	5.0	[.10]
Nickel	69.7	14.0	25.8	16.3	17.0
Potassium	1870	1880	2400	1590	6050
Selenium	5.6j	9.2j	13.2j	21.9j	5.6ur
Silver	13.7	23.9	36.9	36.2	.41u
Sodium	[344]	[254]	[276]	[220]	[389]
Thallium	8.5j	10.1j	14.2j	4.1j	.23uj
Vanadium	34.8	20.5	26.9	31.2	37.7
Zinc	18800	17600	18300	15900	302

- j The associated numerical value is an estimated quantity because the amount detected is below the contract required detection limit (CRDL) or because minor quality control criteria were not met. Presence of the material is reliable.
- r Quality control indicates that data is <u>not</u> usable (material may or may not be present). **DO NOT USE THIS DATA!.**
- u The material was analyzed for, but was not detected. The associated numerical value is the estimated sample quantitation limit or CRDL.
- [] The associated numerical value is an estimated quantity because the amount detected is below the contract required detection limit (CRDL). Presence of the material is reliable. (Inorganic data only).

TABLE 4 CONT. ANALYTICAL RESULTS FOR INORGANIC SEDIMENT SAMPLES (mg/kg) RICHARDSON FLAT TAILINGS SUMMIT COUNTY, UTAH TDD F08-8903-06 - PAN FUTOO39HDA

SAMPLE # PACKING LIST # SAMPLE LOCATION	RFT-OSE-1 4725H-11 OPPORTUNITY POND SEDIMENT SAMPLE	RFT-0SE-2 4725H-12 OPPORTUNITY SEEP SEDIMENT SAMPLE	RFT-SE-16 4725H-13 DNSTRM OF PACE HOMER DITCH CONFLUENCE W/SILVER CRK	RFT-SE-17 4725H-14 UPGRDNT CONFLUENCE SILVER CRK & PACE HOMER DITCH
Aluminum	19500	6880	15200	4440
Antimony	142j	49.3j	53.9j	183j
Arsenic	751	839	211	555
Barium	668	557	209	66.0
Beryllium	[2.3]	[1.6]	[1.4]	[.63]
Cadmium	185j	131j	43.9j	113j
Calcium	249000	167000	14500	18900
Chromium	18.2	1.0u	11.8	.72u
Cobalt	[5.9]	53.3	24.6	76.8
Copper	870	456	231	496
Iron	156000	132000	86100	263000
Lead	12500	6900	4430	12200
Magnesium	29700	23400	6340	5880
Manganese	19600	23700	1560	1370
Mercury	1.9	.73	3.3	.81
Nickel	32.1	26.3 ⁻	22.4	31.4
Potassium	4790	1690	2490	[657]
Selenium	19.9j	2.5j	25.1j	84.0j
Silver	60.6	22.5	15.5	39.8
Sodium	[764]	[206]	[215]	[105]
Thallium	24.1j	21.0j	1.2bj	6.0j
Vanadium	38.0	[18.6]	40.5	[10.4]
Zinc	24000	20000	8580	17500

j - The associated numerical value is an estimated quantity because the amount detected is below the contract required detection limit (CRDL) or because minor quality control criteria were not met. Presence of the material is reliable.

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^{[] -} The associated numerical value is an estimated quantity because the amount detected is below the contract required detection limit (CRDL). Presence of the material is reliable. (Inorganic data only).

TABLE 5 ANALYTICAL RESULTS FOR INORGANIC SURFACE WATER SAMPLES (µg/1) RICHARDSON FLAT TAILINGS SUMMIT COUNTY, UTAH TDD F08-8903-06 - PAN FUT0039HDA

SAMPLE # TRAFFIC RPT # SAMPLE LOCATION	RFT-SW-1A MHP-525 BCKGRND PACE HOMER DITCH	RFT-SW-1B MHP-526 BCKGRND PACE HOMER DITCH	RFT-SW-2A MHP-523 SILVER CRK NEAR FLOOD PLAIN TLGS	RFT-SW-2B MHP-524 SILVER CRK NEAR FLOOD PLAIN TLGS	RFT-SW-3A MHP-521 SILVER CRK NEAR FLOOD PLAIN TLGS
Aluminum	[27.9]ub	[26.3]ub	[18.2]ub	44500b	[16.5]ub
Antimony	19.9u	19.9u	[25.7]ub	210b	19.9u
Arsenic	[7.2]	[7.7]	[6.6]	619	[3.8]
Barium	[61.9]ub	[61.9]ub	[61.5]ub	881b	[52.9]ub
Beryllium	1.1u	1.1u	1.1u	[2.4]	1.1u
Cadmium	1.8u	1.8u	[5.0]ub	137b	9.2b
Calcium	132000ь	131000ь	211000Ъ	248000Ъ	199000Ь
Chromium	2.8u	2.8u	2.8u	72.2	2.8u
Cobalt	[3.1]ub	2.6u	[3.5]ub	[27.0]ub	[2.6]ub
Copper	1.1u	[2.4]ub	[1.2]ub	1390b	[1.5]ub
Iron	[56.4]ub	[84.7]ub	[63.2]ub	98500ъ	[39.9]ub
Lead	9.2bj	[0.93]ub	48.3bj	20000bj	38.2bj
Magnesium	34700b	34400b	41400b	68400b	39600b
Manganese	20.3b	19.1b	1170b	3080b	1080b
Mercury *	0.20u	0.20u	0.20u	11.50	0.20u
Nickel	9.7u	9.7u	[13.9]	67.3	9.7u
Potassium	[1820]ub	[2110]ub	[3180]	8980b	[3470]ub
Selenium	[15.4]ub	[15.2]ub	[2.6]ub	[34.2]ub	[14.7]ub
Silver	1.6u	1.6u	1.6u	131b	1.6u
Sodium	19700	19700	42300b	42900b	41000b
Thallium	0.90u	0.90u	0.90u	[4.7]	0.90u
Vanadium	2.7u	2.7u	2.7u	129	2.7u
Zinc	64.1b	52.7b	1730b	19300b	2360ь

- * Results have been provided by Keystone Laboratory of Houston, Texas. The remaining results are from analyses conducted by Silver Valley Laboratories of Kellog, Idaho.
- b Material was detected in the laboratory blanks. Quantity reported is >5X the amount found in the blank. A false positive result may exist.
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TABLE 5 CONT. INORGANIC ANALYTICAL RESULTS FOR SURFACE WATER SAMPLES (µg/1) RICHARDSON FLAT TAILINGS SUMMIT COUNTY, UTAH TDD F08-8903-06 - PAN FUT0039HDA

SAMPLE # TRAFFIC RPT # SAMPLE LOCATION	RFT-SW-3B MHP-522 SILVER CRK NEAR FLOOD PLAIN TLGS	RFT-SW-4A MHP-515 UPGRDNT DIVERSION DITCH	RFT-SW-4B MHP-516 UPGRDNT DIVERSION DITCH	RFT-SW-5A MHP-517 DIVERSION DITCH	RFT-SW-5B MHP-518 DIVERSION DITCH
Aluminum	1740b	[32.8]	30900	[32.6]	[33.7]
Antimony	[53.8]ub	[39.3]	937	19.9u	19.9u
Arsenic	41.9	68.6	2326	10.7j	17.4j
Barium	[82.2]ub	[102]	2330	[37.0]	[35.9]
Beryllium	1.1u	1.1u	[1.7]	1.1u	1.1u
Cadmium	[16.0]	[4.6]	289	[3.3]	6.2
Calcium	206000Ь	180000	446000	308000	314000
Chromium	2.8u	2.8u	50.2	2.8u	2.8u
Cobalt	[5.7]	[8.8]	[48.7]	2.6u	2.6u
Copper	71.4b	[13.6]	1540	[12.4]	[5.6]
Iron	5320b	267	107000	416	696
Lead	1100ьј	41.8	22100j	12.9	24.9
Magnesium	42000Ь	38000	104000	61600	62700
Manganese	1220b	2780	21100	1310	1340
Mercury *	0.2u	0.2u	8.0	0.2u	0.2u
Nickel	9.7u	9.7u	65.5	[25.8]	9.7u
Potassium	[3160]ub	5580	15600	273u	273u
Selenium	[28.5]ub	14.0ur	1.2ur	14.0ur	14.0ur
Silver	[6.3]ub	1.6u	201	1.6u	1.6u
Sodium	42000b	54600	58500	28800	29300
Thallium	0.90u	14.1	83.4j	1.0u	1.0u
Vanadium	[5.5]	2.7u	58.7	2.7u	2.7u
Zinc	3790ь	2650	49100	2990	3060

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- j The associated numerical value is an estimated quantity because the amount detected is below the contract required detection limit (CRDL) or because minor quality control criteria were not met. Presence of the material is reliable.
- r Quality control indicates that data is <u>not</u> usable (material may or may not be present). **DO NOT USE THIS DATA!**.
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TABLE 5 CONT. INORGANIC ANALYTICAL RESULTS FOR SURFACE WATER SAMPLES (µg/1) RICHARDSON FLAT TAILINGS SUMMIT COUNTY, UTAH TDD F08-8903-06 - PAN FUT0039HDA

SAMPLE # TRAFFIC RPT # SAMPLE LOCATION	RFT-SW-6A MHP-519 DIVERSION DITCH OUTFLOW	RFT-SW-6B MHP-520 DIVERSION DITCH OUTFLOW	RFT-SW-7A MHP-509 MARSHY AREA	RFT-SW-7B MHP-510 MARSHY AREA	RFT-SW-8A MHP-511 SILVER CRK IN MARSHY AREA
Aluminum	[17.6]	[34.7]ub	11.5u	368	[16.8]
Antimony	19.9u	19.9u	19.9u	19.9u	19.9u
Arsenic	2.3u	[3.9]	2.3u	[9.4]	[5.3]
Barium	[14.9]	[14.9]ub	[14.9]ub	[37.0]	[32.1]
Beryllium	1.1u	1.1u	1.1u	1.1u	1.1u
Cadmium	1.8u	1.8u	1.8u	[2.6]	1.8u
Calcium	316000	330000Ъ	322000	333000	320000
Chromium	2.8u	2.8u	2.8u	2.8u	2.8u
Cobalt	2.6u	[3.8]ub	2.6u	[3.8]	2.6u
Copper	[10.4]	[1.2]ub	[1.9]	[12.9]	1.1u
Iron	426	123	270	1070	224
Lead	1.8u	[1.9]ubj	0.90u	131	0.90u
Magnesium	68200	71200b	68700	70500	68600
Manganese	3180	3170b	94.8	2110	960
Mercury *	0.2u	0.2u	0.2u	0.2u	0.2u
Nickel	[13.2]	9.7u	9.7u	9.7u	9.7u
Potassium	[2010]	[2230]	[1480]	[1710]	[1330]
Selenium	14.0ur	12.0u	14.0ur	1.4ur	14.0ur
Sodium	45000	49600b	47500	48400	46700
Silver	1.6u	1.6u	1.6u	[2.4]	1.6u
Thallium	1.0u	0.9u	1.0u	1.0u	1.0u
Vanadium	2.7u	2.7u	2.7u	2.7u	2.7u
Zinc	219	198b	190	656	295

- * Results have been provided by Keystone Laboratory of Houston, Texas. The remaining results are from analyses conducted by Silver Valley Laboratories of Kellog, Idaho.
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- j The associated numerical value is an estimated quantity because the amount detected is below the contract required detection limit (CRDL) or because minor quality control criteria were not met. Presence of the material is reliable.
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TABLE 5 CONT. INORGANIC ANALYTICAL RESULTS FOR SURFACE WATER SAMPLES (µg/1) RICHARDSON FLAT TAILINGS SUMMIT COUNTY, UTAH TDD FO8-8903-06 - PAN FUT0039HDA

SAMPLE # TRAFFIC RPT # SAMPLE LOCATION CRK	RFT-SW-8B MHP-512 SILVER CRK IN MARSHY AREA	RFT-SW-9A MHP-506 SILVER CRK CULVERT NEAR ROUTE 40	RFT-SW-9B MHP-507 SILVER CRK CULVERT NEAR ROUTE 40	RFT-SW-10A MHP-503 DNGRDNT SILVER CREEK	RFT-SW-10B MHP-504 DNGRDNT SILVER CREEK
Aluminum	[106]	[24.6]	370	[26.6]	[75.8]
Antimony	19.9u	19.9u	19.9u	19.9u	19.9u
Arsenic	[8.4]	[6.8]	12.2	[3.3]	[5.6]r
Barium	[33.5]	[54.6]	[59.1]	[51.5]	[52.5]
Beryllium	1.1u	1.1u	1.1u	1.1u	1.1u
Cadmium	1.8u	1.8u	1.8u	[2.0]	[2.2]
Calcium	303000	139000	144000	147000	147000
Chromium	2.8u	2.8u	[2.8]	2.8u	2.8u
Cobalt	2.6u	[2.6]	2.6u	2.6u	[4.0]
Copper	[4.9]	[2.9]	[11.7]	[6.3]	[5.6]
Iron	1090	338	1200	195	481
Lead	36.6	6.2	122	[5.9]	35.8
Magnesium	64900	34600	35600	36400	36200
Manganese	950	274	335	223	240
Mercury *	0.2u	0.2u	0.2u	0.2u	0.2u
Nickel	9.7u	9.7u	9.7u	9.7u	9.7u
Potassium	[986]	[1790]	[1980]	2090	[1920]
Selenium	14.0ur	14.0ur	1.4ur	1.4ur	14.0ur
Silver	1.6u	1.6u	1.6u	1.6u	1.6u
Sodium	44300	22900	23400	25200	24100
Thallium	1.0u	1.0u	1.0u	1.0u	1.0u
Vanadium	2.7u	2.7u	2.7u	2.7u	2.7u
Zinc	332	429	726	419	519

^{* -} Results have been provided by Keystone Laboratory of Houston, Texas. The remaining results are from analyses conducted by Silver Valley Laboratories of Kellog, Idaho.

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 $u\,$ - The material was analyzed for, but was not detected. The associated numerical value is the estimated sample quantitation limit or CRDL.

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TABLE 5 CONT. INORGANIC ANALYTICAL RESULTS FOR SURFACE WATER SAMPLES (µg/1) RICHARDSON FLAT TAILINGS SUMMIT COUNTY, UTAH TDD FO8-8903-06 - PAN FUT0039HDA

SAMPLE # TRAFFIC RPT # LOCATION		RFT-SW-11B MHP-527 DUPLICATE OF 2B	RFT-SW-12A MHP-513 FILTERED BLANK	RFT-SW-12B MHP-514 UNFILTERED BLANK	MHP-529	RFT-SW-15B MHP-53O UNFILTERED BLANK	RFT-SW-16A MHP-534 DNSTRM OF PACE HOMER CONFLUENCE SILVER CRK
Aluminum	[28.0]ub	43400b	[23.3]	[16.6]	[24.9]ub	[32.1]ub	[44.6]ub
Antimony	[26.9]ub	199b	19.9u	19.9u	19.9u	19.9u	[20.1]ub
Arsenic	[5.6]	540	2.3u	12.0	2.3u	2.3u	2.3u
Barium	[60.8]	788Ъ	1.3u	1.3u	1.3u	1.3u	[56.7]ub
Beryllium	1.1u	[2.1]	1.1u	1.1u	1.1u	1.1u	1.1u
Cadmium	6.0b	127b	1.8u	1.8u	1.8u	1.8u	10.3b
Calcium	211000Ь	246000b	[154]	[56.3]	[214]ub	[136]ub	205000b
Chromium	2.8u	68.5	[3.5]	2.8u	2.8u	2.8u	2.8u
Cobalt	[5.3]	[28.4]ub	2.6u	2.6u	2.6u	2.6u	[3.1]ub
Copper	[1.2]	1260b	1.1u	[4.4]	1.1u	1.1u	[2.7]ub
Iron	[55.1]	89300b	277	219	[64.2]ub	[41.5]ub	[31.5]ub
Lead	34.6bj	17900bj	0.90u	0.90u	[1.8]ubj	[1.6]ubj	[1.4]ubj
Magnesium	41400b	67100b	[42.5]	20.9u	[43.7]ub	[29.0]ub	40400b
Manganese	1180b	2950ь	[2.3]	[2.0]	[1.4]ub	[2.5]ub	1070ь
Mercury *	0.20u	8.50	0.2u	0.2u	.20u	. 20u	. 20u
Nickel	9.7u	57.3	9.7u	9.7u	9.7u	9.7u	9.7u
Potassium	[3060]ub	8770ь	273u	273u	273u	273u	[3180]ub
Selenium	[15.1]ub	[43.9]ub	1.4ur	1.4ur	1.2u	1.2u	[2.7]ub
Silver	1.6u	117	1.6u	1.6u	1.6u	23.8b	1.6u
Sodium	41200	42700	[68.9]	[76.0]	[47.5]ub	13.2u	41900b
Thallium	0.90u	[4.2]	1.0u	1.0u	.90u	.90u	.90u
Vanadium	[3.8]	121	2.7u	2.7u	2.7u	2.7u	2.7u
Zinc	1730ь	17700ь	[4.5]	1.3u	[12.6]ub	[6.5]ub	2970ь

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TABLE 5 CONT.

INORGANIC ANALYTICAL RESULTS FOR SURFACE WATER SAMPLES (µg/1) RICHARDSON FLAT TAILINGS

SUMMIT COUNTY, UTAH

TDD F08-8903-06 - PAN FUT0039HDA

SAMPLE # TRAFFIC RPT # SAMPLE LOCATION	RFT-SW-16B MHP-535 DNSTRM OF PACE HOMER DITCH CONFLUENCE W/SILVER CRK	RFT-SW-17A MHP-537 UPGRDNT CONFLUENCE SILVER CRK PACE HOMER DITCH	RFT-SW-17B MHP-538 UPGRDNT CONFLUENCE SILVER CRK PACE HOMER DITCH	RFT-SW-18A MHP-539 BLANK	RFT-SW-18B MHP-540 BLANK
Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron	[61.1]ub 19.9u [5.6] [56.0]ub 1.1u 10.3b 205000b 2.8u [3.5]ub [4.9]ub	[49.5]ub 19.9u 2.3u [54.3]ub 1.1u 13.3b 228000b 2.8u [6.6]ub [3.9]ub 346bj	[29.6]ub [20.1]ub 2.3u [51.1]ub 1.1u 13.5b 218000b 2.8u [5.3]ub [1.5]ub [43.7]ub	[29.0]ub 19.9u 2.3u [1.7]ub 1.1u 1.8u [109]ub 2.8u 2.6u 1.1u [33.4]ub	[27.0]ub 19.9u 2.3u 1.3u 1.1u 1.8u [90.8]ub 2.8u [2.7]ub 1.1u [32.2]ub
Lead Magnesium Manganese Mercury * Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc	25.2bj 40300b 1080b 0.20u [10.6] [3380]ub 1.2u 1.6u 41900 0.90u 2.7u 3130b	8.8b 41800b 1380b 0.20u 9.7u [3630]ub [20.0]ub 1.6u 48000b 0.90u 2.7u 3880b	0.90uj 39900b 1330b 0.20u 9.7u [3570]ub [18.0]ub 1.6u 46400b 0.90u 2.7u 3720b	[1.3]ub [38.6]ub [2.0]ub 0.20u 9.7u 273u 1.2u 1.6u [41.8]ub 0.90u 2.7u [2.9]ub	0.90uj [27.8]ub [1.4]ub 0.20u 9.7u [437]ub 1.2u 1.6u [13.3]ub 0.90u 2.7u 1.3u

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TABLE 5 CONT. INORGANIC ANALYTICAL RESULTS FOR SURFACE WATER SAMPLES (µg/1) RICHARDSON FLAT TAILINGS SUMMIT COUNTY, UTAH TDD F08-8903-06 - PAN FUT0039HDA

SAMPLE # TRAFFIC RPT # SAMPLE LOCATION	RFT-OPW-1A MHP-532 PONDED AREA AT BASE OF TLGS DAM	RFT-OPW-1B MHP-533 PONDED AREA AT BASE OF TLGS DAM
Aluminum	[23.0]ub	317b
Antimony	19.9u	19.9u
Arsenic	[2.9]	33.1
Barium	[37.3]ub	[82.2]ub
Beryllium	1.1u	1.1u
Cadmium	1.8u	[3.6]ub
Calcium	312000	369000Ъ
Chromium	2.8u	2.8u
Cobalt	[6.3]ub	[5.6]ub
Copper	[1.2]ub	[6.6]ub
Iron	503b	10200b
Lead	0.90u	68.2bj
Magnesium	56100b	58800Ъ
Manganese	12900ь	21400b
Mercury *	0.20u	0.20u
Nickel	9.7u	9.7u
Potassium	5380	9960
Selenium	12.0u	[18.5]ub
Silver	1.6u	1.6u
Sodium	60000b	63400b
Thallium	0.90u	0.90u
Vanadium	2.7u	2.7u
Zinc	[19.8]ub	759b

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APPENDIX A SAMPLE COLLECTION AND SHIPMENT INFORMATION

APPENDIX A SAMPLE COLLECTION AND SHIPMENT INFORMATION RICHARDSON FLAT TAILINGS SUMMIT COUNTY, UTAH TDD F08-8903-06 - PAN FUT0039HDA

SAMPLE ID	PARAMETERS	TRAFFIC RPT #	SAMPLE TAG #	CHAIN OF CUSTODY
RFT-SW-1A	METALS	MHP-525	8-94551	8-11438
RFT-SW-1B	METALS	MHP-526	8-94552	8-11438
RFT-SW-2A	METALS	MHP-523	8-94553	8-11438
RFT-SW-2B	METALS	MHP-524	8-94556	8-11438
RFT-SW-3A	METALS	MHP-521	8-94554	8-11438
RFT-SW-3B	METALS	MHP-522	8-94555	8-11438
RFT-SW-4A	METALS	MHP-515	8-94557	8-11438
RFT-SW-4B	METALS	MHP-516	8-94558	8-11438
RFT-SW-5A	METALS	MHP-517	8-94559	8-11438
RFT-SW-5B	METALS	MHP-518	8-94560	8-11438
RFT-SW-6A	METALS	MHP-519	8-94561	8-11438
RFT-SW-6B	METALS	MHP-520	8-94562	8-11438
RFT-SW-7A	METALS	MHP-509	8-94563	8-11446
RFT-SW-7B	METALS	MHP-510	8-94564	8-11446
RFT-SW-8A	METALS	MHP-511	8-94565	8-11446
RFT-SW-8B	METALS	MHP-512	8-94566	8-11446
RFT-SW-9A	METALS	MHP-506	8-94567	8-11446
RFT-SW-9B	METALS	MHP-507	8-94587	8-11446
RFT-SW-10A	METALS	MHP-503	8-94568	8-11446
RFT-SW-10B	METALS	MHP-504	8-94569	8-11446
RFT-SW-11A	METALS	MHP-528	8-94591	8-10998
RFT-SW-11B	METALS	MHP-527	8-94590	8-10998
RFT-SW-12A	METALS	MHP-513	8-94588	8-10998
RFT-SW-12B	METALS	MHP-514	8-94589	8-10998
RFT-SW-15A	METALS	MHP-529	8-94593	8-10998
RFT-SW-15B	METALS	MHP-530	8-94593	8-10998
RFT-SW-16A	METALS	MHP-534	8-94599	8-10997
RFT-SW-16B	METALS	MHP-535	8-94600	8-10997
RFT-SW-17A	METALS	MHP-537	8-94527	8-10997
RFT-SW-17B	METALS	MHP-538	8-94527	8-10997
RFT-SW-18A	METALS	MHP-539	8-94529	8-10997
RFT-SW-18B	METALS	MHP-540	8-94530	8–10997
RFT-TA-1	METALS	MHL-955	8-94580	8-11446
RFT-TA-2	METALS	MHL-956	8-94581	8-11446
RFT-TA-3	METALS	MHP-500	8-94582	8-11446
RFT-TA-4	METALS	MHP-501	8-94583	8-11446
RFT-TA-5	METALS	MHP-502	8-94584	8-11446
RFT-OPW-1A	METALS	MHP-532	8-94595	8-10998
RFT-OPW-1B	METALS	MHP-533	8-94596	8-10998

APPENDIX A CONT. SAMPLE COLLECTION AND SHIPMENT INFORMATION RICHARDSON FLAT TAILINGS SUMMIT COUNTY, UTAH TDD F08-8903-06 - PAN FUT0039HDA

PARAMETERS	SAS #	SAMPLE TAG #	CHAIN OF CUSTODY
METALS	4725H-01	8-94570	8-11437
METALS	4725H-02	8-94571	8-11437
METALS	4725H-03	8-94572	8-11437
METALS	4725H-04	8-94573	8-11437
METALS	4725H-05	8-94574	8-11437
METALS	4725H-06	8-94575	8-11437
METALS	4725H-07	8-94576	8-11437
METALS	4725H-08	8-94577	8-11437
METALS	4725H-09	8-94578	8-11437
METALS	4725H-10	8-94579	8-11437
METALS	4725H-13	8-94525	8-11440
METALS	4725H-14	8-94528	8-11440
METALS	4725H-11	8-94594	8-11437
METALS	4725H-12	8-94597	8–11437
	METALS	METALS 4725H-01 METALS 4725H-02 METALS 4725H-03 METALS 4725H-04 METALS 4725H-05 METALS 4725H-06 METALS 4725H-07 METALS 4725H-08 METALS 4725H-09 METALS 4725H-10 METALS 4725H-13 METALS 4725H-14 METALS 4725H-11	METALS 4725H-01 8-94570 METALS 4725H-02 8-94571 METALS 4725H-03 8-94572 METALS 4725H-04 8-94573 METALS 4725H-05 8-94574 METALS 4725H-06 8-94575 METALS 4725H-07 8-94576 METALS 4725H-08 8-94577 METALS 4725H-09 8-94578 METALS 4725H-10 8-94579 METALS 4725H-13 8-94525 METALS 4725H-14 8-94528 METALS 4725H-11 8-94594

APPENDIX B

SAMPLING PHOTO LOG



PHOTO 1: WEST FACING PHOTO OF SAMPLE LOCATION RFT-SW/SE-4.

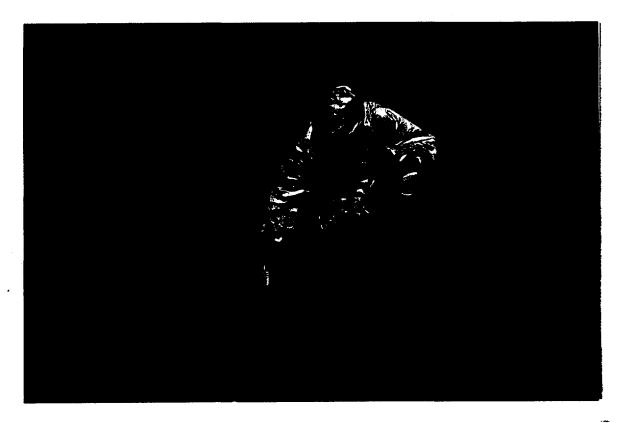
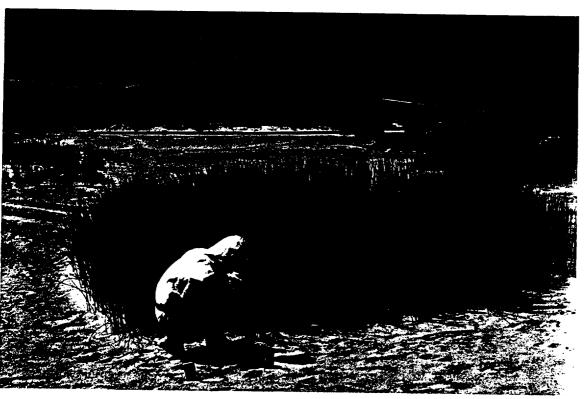


PHOTO 2: WEST FACING PHOTO OF FIT MEMBER COLLECTING TAILINGS SAMPLE RFT-TA-1.



PHOTO 3 (LEFT): NORTHWEST FACING PHOTO OF FIT MEMBER COLLECTING TAILINGS SAMPLE RFT-TA-2.

PHOTO 4 (BELOW): SOUTH FACING PHOTO OF FIT MEMBER COLLECTING TAILINGS SAMPLE RFT-TA-3.



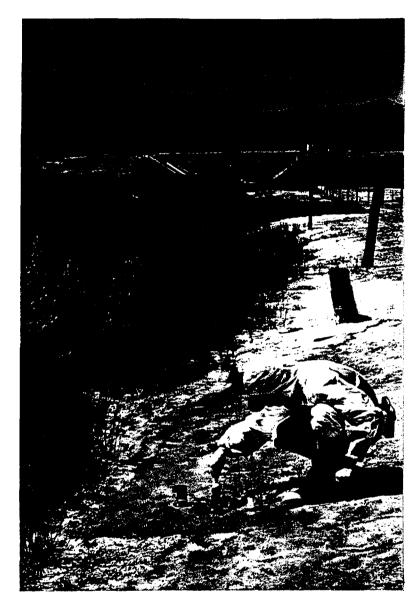


PHOTO 5: SOUTHWEST VIEW OF SAMPLE LOCATION RFT-TA-4.

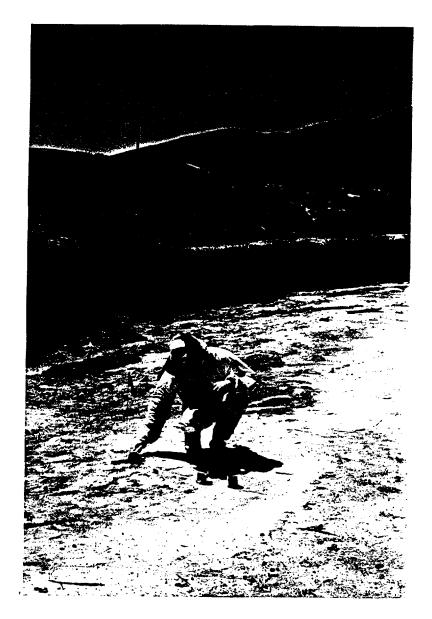


PHOTO 6: SOUTH VIEW OF SAMPLE LOCATION RFT-TA-5.



PHOTO 7: FIT MEMBER COLLECTING SAMPLE RFT-SW-9.

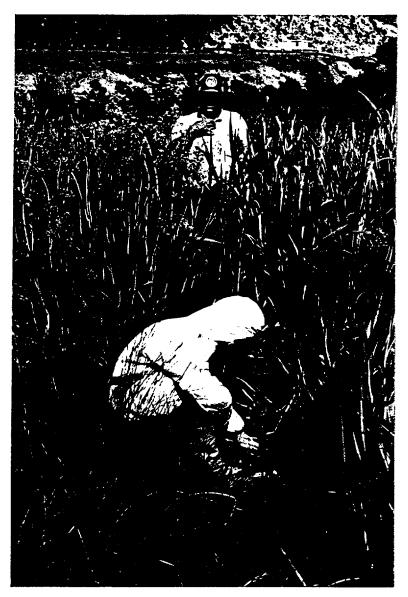


PHOTO 8: NORTHEAST FACING PHOTO OF FIT MEMBER COLLECTING SURFACE WATER SAMPLE RFT-SW/SE-7.



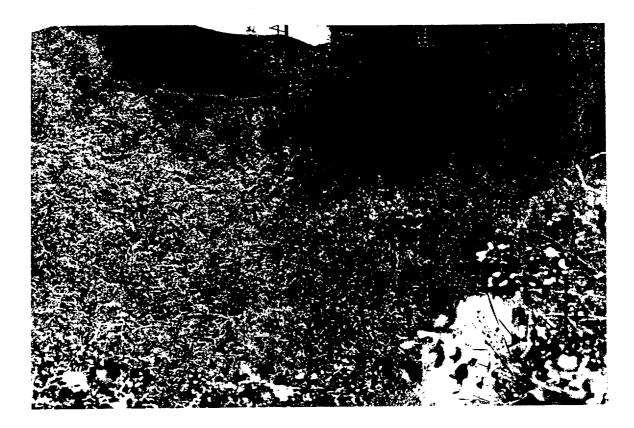
PHOTO 9: SOUTHEAST FACING PHOTO OF FIT MEMBER COLLECTING SAMPLE RFT-SW/SE-8.



PHOTO 10: NORTH FACING PHOTO OF SAMPLE LOCATION RFT-SW/SE-6.



PHOTO 11: WEST FACING PHOTO OF SAMPLE LOCATION RFT-SW/SE-5.



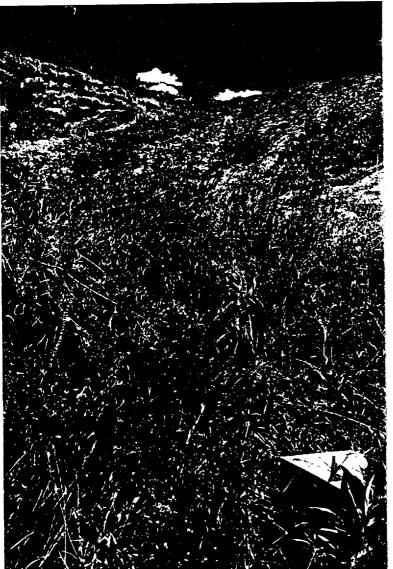


PHOTO 12 (ABOVE): SOUTH FACING
PHOTO OF SURFACE WATER
SAMPLE LOCATION RFT-OPW-1
AND RFT-OSE-1 AT BASE OF
TAILINGS DAM.

PHOTO 13 (LEFT): NORTHEAST
FACING PHOTO OF OPPORTUNITY SEDIMENT SAMPLE
LOCATION RFT-OSE-2.

APPENDIX C

QUALITY ASSURANCE REVIEW

REGION VIII SUMMARY OF DATA QUALITY ASSURANCE REVIEW

guideline	references	are	from	Contract	#787
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Case No.: 12334 TDD No.: F0-8909-08

Site: Richardson Flats

Contractor Laboratory: Silver Valley Labs, Inc.; Kellogg, ID

Data Reviewer: Lynn Fischer Date of Review: Oct. 11, 1989

Sample Matrix: 19 low waters

Analysis: Metals and Mercury.

Sample Nos.: MHP520, MHP521, MHP522, MHP523, MHP524, MHP525, MHP526, MHP527, MHP528, MHP529, MHP530, MHP532, MHP533, MHP534, MHP535, MHP537, MHP538, MHP539, and MHP540.

- () Data are acceptable for use.
- (X) Data are acceptable for use with qualifications noted.
- () Data are preliminary pending verification.
- () Data are unacceptable.

Action required by DPO?

No X Yes The following items require action:

All Mercury data is unusable because of missed holding times. Mercury analysis however was performed by Keystone, TX prior to samples being shipped on to Silver Valley for analysis, this data is being used. SMO, or whomever decided to forward the samples should always consider holding time requirements when making these decisions.

Action required by project officer?

No X Yes

The following are our findings:

Data are acceptable for use, with the exception of the mercury analysis, with the following qualifications.

Holding time criteria were met for all analysis with the exception of the mercury cold vapor analysis; all the mercury results are flagged "a". unusable.

All calibration frequencies and requirements were met.

Quite a few contaminants were detected in analysis of the initial, continuing, and laboratory preparation blanks they are: aluminum, antimony, barium, calcium, cadmium, cobalt, copper, iron, magnesium, manganese, potassium, selenium, silver, sodium, zinc, and lead. All samples with positive results for these analytes were flagged "ub", "uj", or "b". "UB" was used to flag those results detected below the contract required detection limit (CRDL), "uj" was used to flag those results greater than the CRDL but less than five times the greatest amount detected in any blank, and "b" was used to flag all other positive results.

Brackets are applied to all results greater than the instrument detection limit (IDL) but less than the CRDL.

Duplicate results for the following analytes were outside limits (+/-20%), however none were flagged because all were associated with either results below the CRDL, contaminants detected in the blanks, or one of the values was undetected: aluminum, copper, iron, potassium, arsenic, and selenium.

Analysis of the spiked sample had two outliers, lead (16.7%) and selenium (-134.3%), limits are (75-125%). All lead results were flagged "j", results may be biased low. No flags were added to selenium results since both the sample and spiked sample results were less than the CRDL.

All other quality control (QC) criteria were met.

Inorganic Data Completeness Checklist

Inorganic analysis data (Form I) Initial calibration and continuing calibration verification (Form IIA) CRDL standard for AA and ICP (Form IIB) Blanks (Form III) ICP interference Check sample (Form IV) Spike sample recovery (Form VA) Post digestion spike sample recovery (Form VB) Duplicates (Form VI) Laboratory control sample (Form VII) Standard addition results (Form VIII) ICP serial dilutions (Form IX) Holding times (Form X) Instrument detection limits-quarterly (Form XI) ICP interelement correction factors-quarterly (Form II) ICP linear ranges-quarterly (Form XIII) Raw data for interference checks Raw data for calibration standards Raw data for blanks Raw data for CRI and/or CRA Raw data for samples Raw data for duplicates Raw data for spikes

Traffic reports

Contract Compliance

r.		tial and Continuing Calibration idelines pg. E-4, Form IIA)	Verification	on (ICV and CCV)
	1.	Was instrument calibrated dail	y and each t yes X	ime it was set up?
	2.	Were instruments calibrated us	ing 1 blank y es X	and several standards?
	3.	Were calibration verifications	within 90-1 yes X	10%?
	4.	Were continuing calibrations r	un at 10% fr yes X	requency? no
		Were the raw data correctly tr	yes X	no
II.		L Standards for ICP (CRI) and/o m IIB)	r AA (CRA) (guidelines pg. E-6,
	1.	For ICP analysis, were standar (whichever was greater) analyz each sample run, or at a minim whichever was more frequent?	ed at the be um of twice/	ginning and the end of
			yes X	no
	2.	For furnace AA analysis, were beginning and the end of each twice/8 hour shift, whichever	sample run,	or at a minimum of
	3.	Were the CRI and/or CRA standa	rds analyzed yes X	
			y CS 11	no
	4.	Were these data reported on Fo	•	no
		Were these data reported on Fo	rm IIB? yes X anscribed on	noto Form IIB?
III.	5.		rm IIB? yes X anscribed on yes X	no
III.	5. B	Were the raw data correctly tr	rm IIB? yes X anscribed on yes X III) blank (ICB)	no to Form IIB? no analyzed immediately
III.	5. B	Were the raw data correctly trace. Lanks (guidelines pg. E-6, Form Was the initial calibration after the initial calibration	rm IIB? yes X anscribed on yes X III) blank (ICB) n verificati yes X blank (CCB)	no to Form IIB? no analyzed immediately on (ICV)? no analyzed immediately
III.	5. B3	Were the raw data correctly tranks (guidelines pg. E-6, Form Was the initial calibration after the initial calibration Was a continuing calibration	rm IIB? yes X anscribed on yes X III) blank (ICB) n verificati yes X blank (CCB) ation verificyes X	no to Form IIB? no analyzed immediately on (ICV)? no analyzed immediately cation (CCV)?

	4	 How many elements were detection to question 5) 	ted above ti	he CRDLs? o (if 0, g
		4a. How many elements were than one-half the amoun		
	5	5. Were raw data correctly tran		
Com	men t	ts: See narrative for elements	yes X detected in	blanks.
IV.	10	TP Interference Checks (ICS) (gu	idelines pg.	E-7, Form IV)
	1.	. Was the ICS analyzed twice pe	r 8 hour shi y es X	aft?
	2.	Were the ICSs analyzed before	and after s	no
	3.	Was any massive interference	detected?	no X
	4.	Were the ICSs within ±20% mean	n value? y es X	no
	5.	Were raw data correctly trans	cribed onto	Form IV?
v.	Spi	ke Sample Analysis (S) (guidelin	ne pg. E-8,	Form V)
	1.	Were spikes analyzed at a frequ	uency of 1 i	n 20 samples?
	2.	Were spike recoveries correctly	/ calculated yes X	? no
		$% recovery = \frac{(SSR - SR)}{SA} \times 100$		
		SSR = Spiked Sample Result SR = Sample Result SA = Spike Added		
	3.	Were spike recoveries within th	_	75-125%? no X
		3a. For recoveries outside this flagged "N" by the laborato		
		(an exception if granted where the spike concentration)	•	
		4. Were raw data correctly tra	nscribed ont	o Form V?

yes	X	no	

* Refer to page E-9 (SOW 787) for information regarding the amount of spike to be added for each analyte and for other information about the Spike Sample Analysis.

_VI. Duplicates (D) (guidelines pg. E-11, Form VI)

- 1. Were duplicates analyzed at a frequency of 1 in 20 samples?

 yes X no
- 2. Were RPDs correctly calculated? yes X no _

$$RPD = \frac{S - D}{(S + D)/2} \times 100$$

- S = Sample
- D = Duplicate

3 a	• For sample concentrations >5x the CRDL, were RPDs ±20%? (limits of ±35% apply for soil/sediment/tailings samples) yes X no NA
3b	For sample concentrations >5x the CRDL, did duplicate analysis results fall outside the control window of ± the CRDL? yes no X NA
3c.	Where the RPDs exceeded the control limits, were the data flagged '*' on Forms I and VI by the laboratory? yes X no NA
4.	Were raw data correctly transcribed onto Form VI? yes X no
- Field	er Considerations: I blanks cannot be used for duplicate analyses cates must be analyzed for each analytical method
	aboratory Control Sample (LCS) Analysis (guideline pg. E-12, Form
1	. Was an LCS analyzed for every sample delivery group or batch of samples, whichever was more frequent? yes X no
2	• Were recoveries within the 80-120% limit? yes X no
	-if the recoveries were outside this range the analysis must be terminated, the problem corrected and the previous samples associated with that LCS redigested and reanalyzed.
3	. Were the raw data correctly transcribed onto Form VII? yes X no
	TII. Furnace Atomic Absorption (AA) QC Analysis (guidelines pg14, Form VIII)
1	. Does the raw data package contain absorbance values for two injections per sample, the average values and the relative standard deviation (RSD)?
	yes X no
2	For analyte concentrations > the CRDL, did the RSD for the duplicate injections agree within 20%? (if yes, go to question 3)
	yes X no
	$RSD = \frac{SD}{M} \times 100$
	SD = Standard Deviation of Duplicate Injections M = Mean of Duplicate Injections

. •

	2a. Were samples that exceeded the 20% criteria reanalyzed? yes no
	2b. Did any reanalyzed samples exceed the 20% criteria? yes no
	2c. If yes, did the laboratory flag the data of Form I with an 'M'?
	yes no
3.	Was the recovery of the spike > 40%? (if yes, go to question 4).
	yes X no
	If no, was the sample diluted and rerun with another spike? yes no
4.	Was sample absorbance >50% of spike absorbance?* (if yes, go to question 5).
	yes no X
* Spike a	bsorbance = absorbance of spiked sample - absorbance of sample.
	4a. For spike recoveries between 85 and 115%, were results reported to the IDL?
	yes X no
	$RPD = \frac{(SSR - SR)}{SA} \times 100$
	SSR = Spike Sample Recovery SR = Sample Result SA = Spike Added
	4b. For spike recoveries outside the 85 and 115% range, were results reported to the IDL and flagged with 'W'? yes X no
5.	Was spike recovery between 85 and 115%? (if no, go to question 6)
	5a. Were results quantified from calibration curve and reported to IDL?
	yes no
6.	Was an MSA at 50, 100 and 150% of the sample absorbance analyzed?
	yes no
	6a. Was each MSA analysis identified in the raw data along with the slope, intercept and correlation coefficient? yes no
	6h Were these data correctly transcribed onto Form VIII?

		yes	no
	6c. Were correlation coeffic	cients(r) > 0 yes	0.995? no
	6d. If no, were MSAs run one	yes	no
=	- If the correlation coeffice Form I must be from the on Forms I and VII must	run with the	best 'r' and the dat
	Were these criteria met?	? y es	по
	6e. Were all MSA obtained da form I?	ıta marked wi	th an 'S' or an S+ on
		yes	no
. ICP	Serial Dilution (L) Analysis	(guidelines	pg. E-12, Form IX)
1.	Was an ICP serial dilution pe of a similar matrix (i.e., so (i.e., low, high) or for each was more frequent?	il, water) a	nd concentration
		yes X	no
2.	For elements with concentrati the serial dilution results b questions 3 and 4)	y more than 1	
	% difference = $\frac{I - S}{I}$ X 100) /	
	<pre>I = Initial Sample Result S = Serial Dilution Result (in)</pre>	nstrument rea	nding X5)
3.	Which elements had concentrate criteria? only those associate contaminanats.	- · · · · · · · · · · · · · · ·	
4.	Did the laboratory flag these		'E' on Form IX?
5.	Were the raw data correctly to		to Form IX?
Insti	rument Detection Limits (IDL)	(guidelines p	g. E-13, Form XI)
1. 4	Vere IDLs reported for each ana		t? no
2. W	Were IDLs reported for each ins		? no

3. Did the IDLs meet the contract requirements? (refer to pg. E-13, SOW 787)

IX. ICP

X.

- XI. Interelement Corrections for ICP (guidelines pg. E-13, Form XII)
 - 1. Were correction factors reported on Form XII?

 yes X no
- XII. Linear Range Analysis (LRA) (guidelines pg. E-14, Form XII)
 - Was a linear range verification standard analyzed?
 yes X no ____
 - 2. Was the results within $\pm 5\%$ of the true value? yes X no ____

Holding Times

Limits: Metals - 6 months; Hg - 30 days; Cn - 28 days.

- 1. Verified date of sample receipt by laboratory 8-16-89
- 2. Date of preparation/analyses ICP 8-24-89

AS - 8-31-89

SE - 8 - 31 - 89

PB - 8-29-89

TL - 8-24-89

3. Were holding times met? yes X, for all but HG

U.S. EFA - CLP.

	•	TWODGINTO	1_ Malysis data sh	EET-	EPA SAMPLE NO.
			1		MHPS20
Lab Name: SILVE			_ Contract:	D3-0014	
tab Code: SILVE	R C	120 No.: (2	SAS NO.:		SDG No.: MHP
Matrix (soil/	rater): WA	TEL		ab. Sampl	***************************************
Level (low/med	n: Lo	N	r	ate Rece	ived: <u>\\/\/\/\/\/</u>
solids:	<u> </u>	0			
Co	ncentration	Units (ug/	L or mg/kg dry	weight):	UG/L
				1 1	1
	CAS No.	Analyta	Concentration C	<i>i i</i>	H
	7429-90-5	Aluminum.	[34,7]	C.R	DE MANORA
	7440-36-0	Antimony	19.9]	ア i .
	7440-38-2	Arsenic	3.9		E Mag
	7440-39-3	Barium	14.9		D 10/0/89
	7440-41-7	Beryllium	1.1 4		P 789
•	7440-43-9	Cadmium	1.8		Z i
	7440-70-2	Calcium	830000.	.R	Zinki.
	7440-47-3	Chromium	a.8 4	11	F
	7440-48-4	Cobalt	L3.87 K		
	7440-50-8	Copper	[1.a. B	:ا <u>ـــــا</u>	P luf
	17439-89-6	Iron	183,		P
	7439-92-1	Lead	1,4		F. Jan
,	7439-95-4	Magnesium			Ac
	Ţ	Manganese	3170.		P AF
		Mercury	0.214	<u> R</u>	E LAF
•	17440-02-0	Nickel	9.7	!!·	
	7440-09-7	Potassium	<u> </u>	-10	P AF
	7782-49-2	Selenium_	19.0 14	NX	LAr .
	7440-22-4	Silver	1.6.11	8	5. }.
•	7440-23-5 7440-28-0	Sodium Thallium	49600. 0.9 U	} 	D Ar
	7440-28-0	Vanadium_	——————————————————————————————————————		P Ar
	7440-62-2	Zinc	198.	В	Jir Jir
	/440-00-0	Cyanide		''	2 3 3 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
	• • • • • • • • • • • • • • • • • • • •	Cyantus			
		·		·	 '
olor Before: (DOLLESS	Clarit	y Before: UE		Texture:
olor After: (laceles	S Clarit	y After: UEA		Artifacts:
Imments:					

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

Case. No.: 12334

Contract: \$8-0074

MHP5ZI

Lab Name: SILVER VALLEY LABS, INC.

, m

SAS No.: 19046

SDG No.: MHP520

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med):

Lab Code: SILVER

LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

	!				:
CAS No.	: Analyte	Concentration 	ici a	: M	i I
7429-90-5	Aluminum	116.57	'_' 또! 니용	; =-	KAF
17440-36-0	Antimony		UI	TP-	2
17440-38-2	Arsenic	[3.8]	BIX	IF	900
17440-39-3	Barium	[52.9]	B: UB	LP_	LACOR.
: <u>7440-41-7</u>	Beryllium	1.1_	: U:	<u> </u>	
	<u>Cadmium</u>	19.2		<u> </u>	
	<u>Calcium</u>	199000	<u> </u>	<u> 부른</u> _	1415
	<u>Chromium</u>		[일:	<u> </u>	1
	<u>Cobalt</u>		<u> </u>		luni Luni
	Copper	[1.57] [39.97]	BING	<u>: P</u> _	16415
	<u>Iron</u>	38.2	INS BI		3346
	Lead <u>Magnesium</u>	39600	1 18		In St
	<u>Manganese</u>	1080	13	; ; P	lands.
	Mercury	~~~~~~~~~	UN R	İÇV	370 (A
	Nickel		= 1	IP.	200 A
	Potassium		B: 44		lar B
	Selenium :	14.7	B! N* (4)	IE_	تهوا
	Silver	1.6	UI.	IP_	!
7440-23-5	Sodium :	41000	13	<u></u>	l'aif
<u>7440-28-0 </u>	<u>Thallium</u> :		1214 -	<u></u>	146
	' <u>Yanadium</u> '		<u> </u>	<u> </u>	1
<u>7440-66-6</u> _	Zinc:	2360_	13	<u></u>	!'AF
	Cyanide:			<u>:NR</u>	:
· :			_;	i	;

Color Before: COLORLESS

Clarity Before: CLEAR

Tartura

Color After:

COLORLESS

Clarity After: CLEAR

Artifacts

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS. INC.

Lab Code: SILVER

Case No.: 12334

SDG No.: MHP520

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med):

LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (uq/L or mg/kg dry weight): UG/L

:			: :		!
CAS No.	Analyte	:Concentration		M	
1	1	!	1 1	1	1
: 7429-90-5	Aluminum	1740	: <u>:</u> B	; P	JUA F
1 <u>7440-36-0</u>			IEI DA	12	1145
: <u>7440-38-2</u>	Arsenic	41.9	<u> </u>	<u>:F</u>	09/95
17440-39-3	Barium	182.21	1 <u>81 us</u>	<u>:P_</u>	LAT
17440-41-7	Beryllium	1.1_	: <u> </u>	<u>: P</u>	+
1 <u>7440-43-9</u>	Cadmium	16.0	1 <u>1 B</u>	<u> </u>	UHF
: <u>7440-70-2</u>	<u>Calcium</u>	206000	1_13	<u> </u>	LINE
: <u>7440-47-3</u> :	Chromium	2.8	; ភ <u>ិ </u>	<u> </u>	!
: <u>7440-48-4</u> :	Cobalt	115.71		<u> </u>	- عاد ا
	Copper	71.4	! <u> </u>	<u>:P</u> _	
: <u>7439-89-6</u> _:	Iron :	<u> </u>	<u> </u>	<u>: P</u> _	HAF
<u>7439-92-1_</u>	Lead	1100	1_13_1	12_	liar
: <u>7439-95-4</u> :	Magnesium:	42000		<u> </u>	
: <u>7439-96-5</u> _:	Manganese:	<u> 1220</u>	13	<u> 12</u>	Live
: <u>7439-97-6</u> _:	Mercury	<u>2.2</u> _	<u> </u>	<u>:CY</u>	OPPS LAF
	Nickel :		. n†	<u>: 2_</u>	100
	Potassium:				1:26
	Selenium :		BIVAX -		
	Silver:			<u> </u>	
	Sodium !			<u>: P</u> _	l di
	Thallium:	0.90		<u> </u>	1
	<u>Vanadium</u> :			12_	
	Zinc;	3790_	_13	12_	• • •
	Cyanide:			<u> </u>	
			_ !	¦	

Color Before: BROWN

Clarity Before: CLEAR Texture:

Color After: BROWN

Clarity After: CLEAR

Artifacts:

EPA SAMPLE NO.

INDREANIC ANALYSIS DATA SHEET

68-6074:

Lab Name: SILVER VALLEY LABS, INC.

MD1002/89

Lab Code: SILVER

Case No.: 12334

SAS Na .:

SDG No.: MHP520

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med):

LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

ICAR No		: Concentration		G.	: : M	1
CAS No.	, whater	, concentration	، ت !	Lif	!	!
7429-90-5	Aluminum	18.2	B'	ties	P	La.
17440-36-0		25.7			TP_	104
7440-38-2		[6.6]			F	30
7440-39-3		61.5			P	luicon.
7440-41-7			: Ū:		[P	
	Cadmium	5.01	8		; P	1 Litt-
17440-70-2		211000	/			LAF
	Chromium	2.8	: U :		; P	1
7440-48-4		(3.57)	B.	Li13	1 P	LUYF
	Copper	$\int 1.27$	B	uis	: P	LLAF
	Iron				10	و مستلون!
	Lead	48.3	_]	US X BU	F	1000
	:Magnesium:	41400	_]		<u> </u>	J-200
	:Manganese			7	P_	101/2
	Mercury	0.20	<u> </u>	N R	CV	1 09 30 LAF
17440-02-0	Nickel	13.9]	R		<u> </u>	line de
	Potassium	<u> </u>	K	いら	<u> </u>	lute 5
	Selenium :	12.67	F	N# uR	F_	LAIF
	Silver	1.6	<u>U:</u>		12	:
17440-23-5	Sodium	42300		3	<u> </u>	lusi-
7440-28-0	Thallium :	0.90	<u>.u</u>		E_	!
7440-62-2	<u>Vanadium</u>	2.7	<u>u:</u>		P_	1
17440-66-6	Zinc	1730		B	P_	Lar
	Cyanide :			·	NR	!
	/		_ ;			;

Color Before: COLORLESS

Clarity Before: CLEAR

Texture:

Color After:

COLORLESS

Clarity After: CLEAR Artifacts:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS, INC.

Contract: 100 100 10071

MHP524

Lab Code: SILVER

Case No.: 12334

SAS No.:

SDG No.: MHP520

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med):

LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

						1
CAS No.	Analyte	Concentration: !	C	Q	M !	:
7429-90-5	Aluminum	44500	;	B	; _P -	MAF
	Antimony	210	;	7)	; P	JIC
	Arsenic	619	;		i P	;
	Barium	881	;		P	Kur (*
	Beryllium	[2.4]	: Ē		TP-	ì
	Cadmium	137			; P	lutic
	Calcium	248000	: ;	3	P	1646
	:Chromium	72.2	:		P	1
	Cobalt		: <u>F</u> /:			Lite
	Copper :	1390			; P	LAC
	Iron	98500	: - -	3	; P	juar -
	Lead	20000	;	2)	P-	1416
	Magnesium	68400	: -:	3	P	turi-
:7439-96-5	Manganese		;	8	; P	Lar
17439-97-6	Mercury	39.2	;			: 398 LAF
17440-02-0	Nickel	67.3	:		<u> </u>	20839
17440-09-7	Potassium	2980	-		P_	Each
17782-49-2	Selenium :	(34.27)	8		F_	
17440-22-4	Silver :	131		73	2	Life
17440-23-5	Sodium	42900		ণ্ড	P_	La F
17440-28-0	Thallium :	[4.7]	B.	W	F_	1-46
17440-62-2	:Vanadium :	129			P_	1
17440-66-6	Zinc	19300		З.	<u>P</u>	ا الله الله الله الله الله الله الله ال
	Cvanide :				NR	!
1			_			1

plor Before: BROWN

Clarity Before: OPAQUE

Texture:

Color After: BROWN

Clarity After: OPAQUE

Artifacts:

__mments:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS, INC.

63-68-6074 (3-60-6074) المراجعة (3-60-6074) MHP525

Case No.: 12334

SAS No.:

SDG No.: MHP520

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med):

Lab Code: SILVER

LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

	1	•		: : M	1
CAS No. '	: Analyte	Concentration	ici a	1 14	i I
17429-90-5	Aluminum	727.93	'' ! K ! 116	-¦_=-	1 1:
				- ;	1
1 <u>7440-36-0</u>			~~~~~~~		3
	<u>Arsenic</u>	<u></u>		<u> </u>	930
	<u>Barium</u>	/61.9.7		<u> </u>	الموم
	:Beryllium:			. 그 은 _	٠ ح
+ <u>7440-43-9</u>	: <u>Cadmium</u>	1.8		<u> </u>	}
1 <u>7440-70-2</u>	: <u>Calcium</u>	132000	1 1 3	<u> </u>	LAF
17440-47-3	:Chromium	2.8	: U:	<u> 12</u>	1
17440-48-4	:Cobalt	[3.1]	B Luc	<u>:P</u> _	lai"
17440-50-8	:Copper	1.1	UI.	; P_	1
17439-89-6	Iron	[56.4]	BY LB	; P	د دوالا
17439-92-1	Lead	9.2) [F	1075
17439-95-4	: Magnesium	3#700	B	<u> </u>	lar dy
17439-96-5	: Manganese	£	13	10	pai 💂
17439-97-6	Mercury	0.20	UINR	1CV	- TRU COSEO !
17440-02-0	Nickel	9.7	U:	18	4
17440-09-7	Potassium	18201	B! 148	<u> </u>	Like Say
;7782-49-2	Selenium	15.47	BIN*	; F_	انساز
	Silver	1.6	บไ	; P	1
	:Sodium :	19700		I P	:
17440-28-0	:Thallium :	0.90	u:	F	:
	Yanadium	2.7		TP.	1
:7440-66-6		64.1	; <u>R</u>	TP-	LUA F
:	Cyanide			INR	!
			:		}
	· '				

Color Before: COLORLESS

Clarity Before: CLEAR

Texture:

Color After:

COLORLESS

Clarity After: CLEAR

Artifacts:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS, INC.

Lab Code: SILVER

Case No.: 12334

SAS No.:

SDG No.: MHP520

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med):

LOW

Date Received: 08/16/89

% Solics:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

			 -		7	' ₁
CAS No.	Anaiyte	Concentration 	C	Q	M	1
7429-90-5	Aluminum	26.31	Ē	-15	<u> </u> = -	 _ar
17440-36-0		19.9			<u>:</u> P	١
:7440-38-2		[7.7]			F	
17440-39-3		[61.9]	B	lui³.] P	LAF CORD
17440-41-7					<u> </u>	;
17440-43-9		1.8	Ū		<u>: P</u>	1
17440-70-2	Calcium	131000		·B	<u> </u>	ine
17440-47-3		2.9	Ų.		<u>; P</u>	e i
17440-48-4		2.6	Ū		<u> </u>	:
1 <u>7440-50-8</u>	Copper :	[2.4]	B	uB	; P	1-45
17439-89-6	:Iron :	[84.7]	B	th	IP_	1.41
7439-92-1	Lead :	0.937	B !	NIA	; F	1335 m
17439-95-4	Magnesium:	34400	- 1	7	<u>: P</u> _	Interior
17439-96-5	: <u>Manganese</u> :	19.1	:	्र	<u>: P</u> _	Late
17439-97-6	Mercury :	0.20	<u>U1</u>		<u>: CY</u>	
17440-02-0_1	Nickel :	9.7	<u>U!</u>		<u>: P</u> _	200
: <u>7440-09-7</u> _:	<u>Potasalum</u>	21103	B:	lin.	<u>P</u>	15-16 Pg
17782-49-2_1	Selenium :	15.27	B.	N*	<u>:E</u>	ارس ا ماس
17440-22-4_1		1.6	U1		<u> </u>	:
17440-23-5_1	<u> Sodium </u>	19700 :	_;		<u> </u>	!
; <u>Z440-29-0</u> ;	Thallium :	0.90	<u>Π1</u>		E_	:
	<u>Yanadium</u> (2.7.			<u> </u>	:
: <u>7440-66-6</u> _:	Zinc	52.7_1	_!		LP_	
!	CASUIGE :				NR	;
			_;			;

olor Sefore: COLORLESS

Clarity Before: CLEAR

Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

_omments:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS, INC.

Contract; G-W3-W7

MHP527

Lab Code: SILVER

Case No.: 12334

SAS NO 100

SDG No.: MHP520

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med):

LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

						:
CAS No.	: Analyte	Concentration	c		M	1
	;		; _ ;		;	;
7429-90-5	Aluminum	43400	_	18	<u> 1 P</u>	Lur
7440-36-0		199		13	<u> </u>	luir
7440-38-2	:Arsenic	540	<u>;</u>		<u>: P</u> _	1
7440-39-3	Barium	788_	: _ :	B	<u> </u>	KHF
7440-41-7	Beryllium	[2.1]	<u>B(;</u>		<u> P</u>	luti
7440-43-9	Cadmium	127_	::	3	<u>: P_</u>	LAF
7440-70-2	Calcium	246000	:_:	<u>3</u>	<u> </u>	LAF
7440-47-3	Chromium	6 8. 5	: _ :		LP_	;
7440-48-4		[28.4]	R	. 15	<u> </u>	LAF
7440-50-8	Copper	1260	: _]	16	<u>: P</u>	luit.
7439-89-6	:Iron	89300	_	73	<u>: P_</u>	145
7439-92-1	:Lead	17900	: <u> </u>	5 J	<u>: P</u> _	LAF
7439-95-4	: Magnesium			9	: 2	Lute
7439-96-5	Manganese		1 _ 1	3	<u>: P</u> _	
	Mercury	36. <u>0</u>	1 _ 1	N R	<u>:CY</u>	: 300 LAT
7440-02-0	Nickel	57.3	1		; P	lini a
7440-09-7	: Potassium	8770_	1	2	<u>: P</u>	lini -
7782-49-2	Selenium		BI	N# Win	:F	المحر المانا
	Silver :	117			; P	lutif
7440-23-5		42700			<u> </u>	;
7440-28-0	:Thallium	[4.2]	B'	W	F	; UFF
7440-62-2	'Vanadium	121			<u> </u>	:
7440-66-6	:Zinc :	17700	1	3	<u>: P</u>	iui-
	Cyanide :				INR	:
	!				1	:

Color Before: COLORLESS

Clarity Before: CLEAR

Taxtura

Color After:

COLORLESS

Clarity After: CLEAR

Artifacts:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS, INC.

Case No.: 12334

SDG No.: MHP520

Matrix (soil/water): WATER

Lab Code: SILVER

Level (low/med):

Lab Sample ID:

Date Received: 08/16/89

% Solids:

0.0

LOW

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	·						
	CAS No.	: ! Analyte !	¦ Concentration !	C	Q.	: : M :	: :
7440-36-0 Antimony 25.9 El uA IP 17440-38-2 Arsenic 5.6 El uA IP 17440-41-7 Beryllium 1.1 UI IP 17440-43-9 Cadmium 6.0 13 IP Lar 17440-47-3 Chromium 2.8 UI IP Lar 17440-48-4 Cobalt 5.3 El uA IP Lar 17440-50-8 Copper 5.1.2 El uA IP Lar 17439-92-1 Lead 34.6 LAA IP Lar 17439-95-4 Magnesium 41400 LA IP Lar 17439-97-6 Marcury 2.20 UI Copper 1.20 UI UI UI UI UI UI UI U	7429-90-5	Aluminum	<u> </u>	Ē	'.ניז	P	Par
	1 <u>7440-36-</u> 0	Antimony	<u> 726.9</u>	B :	, <i>8</i> 5	<u>: 2_</u>	12
7440-33-3 Barium			(5.6)	8	NW	F	10 330 CH
7440-41-7 Beryllium			[60.8]	8	'.u.\\	P	1 -0 a. m. ii
7440-43-9 Cadmium			1.1	ιŪ		P	1 9
7440-70-2 Calcium							[Ln i
7440-47-3 Chromium 2.8 U P			211000		B	. P	line
							!
7440-50-8 Copper						; P	Litt
7433-93-6			(1.27)	8:	Luis	P -	1 ()
7439-92-1 Lead			55.1	BI	.iB	: P	المنظرة ا
7439-95-4 Magnesium 41400 K			34.6		NA.	F	200
7439-96-5 Manganese 1180 1			41400			: P	luni 49
7439-97-6 Mercury			1180		,λ	P	LHZ.
7440-02-0 Nickel			0.20	\overline{U}_{i}^{T}	N R	CV	320AG
			9.7	ŪΙ		2	200
7782-49-2 Selenium 15.1 B NW* F			3060";	B!	tids	P_	MI A
7440-22-4 Silver 1.6 U 1P			15.1	BI	NW* · ·	F_	i-nf
7440-28-0 Thallium 0.90 U			1.6	<u>U:</u>		2_	!
<u>7440-62-2 Vanadium </u>	:7440-23-5_;	Sodium ;	41200 ;	_!		<u>P_</u>	!
17440-66-6 Zinc 1730 18 1P Gre	17440-28-0_1	Thallium :	0.90	<u>U1</u>		F_	}
17440-66-6 Zinc 1730 18 1P Gre						<u>P_</u>	ułi-
Cyanide NR	7440-66-6	Zinc	1730 :		13	P_ :	шÉ
	!!	Cyanide :				NR:	
	1	;		_;	:	;	

(lor Before: COLORLESS

Clarity Before: CLEAR Texture:

Color After:

COLORLESS

Clarity After: CLEAR

Artifacts:

(mments:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS, INC.

Contract: 63-83-6374

MHP529

Case No.: 12334

SAS No.:

SDG No.: MHP520

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med):

Lab Code: SILVER

LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

!			 ! !	:	!
CAS No.	Analyte	Concentration	ic: a	M	
1	1	! !		:	:
17429-90-5	Aluminum	[24.9]	BI UA	; P	lui č
17440-36-0		19.9		<u> </u>	:
	Arsenic	2.3		TF	388
17440-39-3		1.3		12	0.30
	Beryllium			<u> </u>	0 185 64 8-
	Cadmium	1.8	: [] :	; P	;
17440-70-2		(214)		TP-	LAF
	Chromium	2.8		I P	1
	Cobalt	2.6		I P	}
7440-50-8		1.1		ī P	<u> </u>
	Iron	64.21	BI W	; P	1645
	Lead			:F	HORS W
17439-95-4	Magnesium	₩3.7 <u>1</u>	BILLA	: P	AF
	Manganese		B : 413	1 P	inte
	Mercury	0.20	IUIN R	CV	395AF
	Nickel	9.7	เบเ	; P	000
17440-09-7	Potassium	273	UT	12	
17782-49-2	Selenium :	1.2	U : NW*	F	LA
	Silver	1.6	U.	12	!
	Sodium :	47.5]		: 2	LAF
	Thallium :	0.90	Ü.	:F	}
7440-62-2	Vanadium_	2.7	Ü.	; P	r I
	Zinc	[12.6]	BY WB	1P	آنابل (
1	Cyanide:			INR	!
!				<u></u>	!
			_ _		

Color Before: COLORLESS

Clarity Before: CLEAR

Texture:

Color After:

COLORLESS

Clarity After: CLEAR

Artifacts:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

61-68-0074:

Lab Name: SILVER VALLEY LABS, INC. Contract:

MB10/0487

Lab Code: SILVER

Case No.: 12334 SAS No.:

SDG No.: MHP520

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med): LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

		~~					
;	CAS No.	 Analyte !	: Concentration: !	: : : : : :	_	: : M :	! ! !
i	7429-90-5	Aluminum	32.1	Ē	ા,પારે	<u> </u>	LAF
	7440-36-0		19.9	ı ÜŢ		; P	1
	7440-38-2		2.3	: Ū.	X	: F	298
	7440-39-3		1.3			[2]	09/08/89
	7440-41-7		1.1	: ŪI		<u> </u>	; 709
		Cadmium :	1.8	ΙŪΙ		; P	! !
1	7440-70-2		∫136] ;	BI	City	; P	LAF
		Chromium :	2.8			<u> </u>	!
;	7440-48-4	Cobalt	2.6	ı U I		P	t i
	7440-50-8		1.1	UI		12	1
	7439-89-6_1		[41.5]	B:		: P_	محمد المحمد
1	7439-92-1	Lead :	(1.6)	B!	NWX Last		المراجعة
;	7439-95-4_	<u>Magnesium</u> :	(29.03)	B:	1618		! LAF U
	7439-96-5_1			BI	ذراغ	١٢_	luir.
!	7439-97-6_	Mercury :	0.20	υ.	N R	CY	BAS AF
1	Z440-02-0_;	Nickel!	9.7.	<u> 11</u>		P_	TOPPE
;	<u>7440-09-7</u> 1	Potassium:	273_1	<u>⊓:</u>		<u> </u>	; 707
;	<u> 7782-49-2</u> _;	Selenium :	1.2	<u>U1</u>	<u>N*</u>	LE_	
		Silver:	23.8 !		~~~~~~		المناه
	<u>7440-23-5</u> :		13.2	UI.		2_	!
!	<u> 7440-28-0</u> _:	Thallium !	0.90			E_	
	<u> 7440-62-2</u> _:		2.7_1			<u>P_</u>	
1	<u> 7440-66-61</u> :	Zinc !	[6.5]:	里!	Luis :	면_ :	ofF.
;	;	Cyanide:				<u>NR</u>	
;		:		_ ! .	[}]		

(dor Before: COLORLESS

Clarity Before: CLEAR Texture:

Color After: COLORLESS

Clarity After: CLEAR Artifacts:

_mments:

EPA SAMPLE_NO.

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS, INC.

Contract: 68-68-6074

MHP532

Case No.: 12334

SAS No.:

SDG No.: MHP520

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med):

Lab Code: SILVER

LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

·					
	i		i i	1 /	i
CAS No.	Analyte	Concentration	(C) O	M	i
			<u> </u>	-!=-	<u> </u>
1 <u>7429-90-5</u>		: <u>23.</u> 0)		<u>-:P</u> -	1-417
<u>7440-36-0</u>	Antimony.	19.9		<u> </u>	1 2
: <u>7440-38-2</u>	Arsenic	12.92		<u> </u>	13 13 15 15 15 15 15 15 15 15 15 15 15 15 15
: <u>7440-39-3</u>	Barium	<u></u>	1 <u> 18 12 18 19 19 19 19 19 19 19</u>	_12_	LUTT CAL
: <u>7440-41-7</u>	Beryllium	1.1	: <u>U.L.</u>	<u> </u>	Ago.
17440-43-9	Cadmium	1.3	: <u>U:</u>	_ <u> </u>	1
17440-70-2	Calcium	321000	_	<u>:P</u>	;
17440-47-3	Chromium	2.8	: U I	<u>: P</u> _	;
17440-48-4	Cobalt	[6.3]	18 LB	18	l'af
	Copper	[1.2]	Blub	P_	lui
	Iron	503	(: P	سيظيرا
17439-92-1	Lead	0.90	U I NIWX	; F_	Say
	Magnesium	56100	<u> </u>	; P_	lutí 39
	Manganese	12900	; i3	<u>:P</u>	lutif _
	Mercury	0.20	iuin e	:CV	: 3 LAF
	Nickel	9.7	UI	; P_	: 35%
	Potassium:	5380	1 1	I P	ميو
	Selenium_	12.0	UINW*	IF_	LAF S
17440-22-4	Silver	1.6	ıüı] P	
17440-23-5	Sodium	60000	18	: P_	i:J}F
17440-28-0	Thallium_	0.90	i Ü i	IF_	;
17440-62-2	Vanadium :	2.7	iu:	; P	! !
	Zinc	19.87	B ! in	TP_	1145
	Cyanide		1	INR	}
			1	1	;

Color Before: COLORLESS

Clarity Before: CLEAR

Texture:

Color After:

COLORLESS

Clarity After: CLEAR

Artifacts:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

6-mg-0074

Contract: 60 D3

MHP533

Lab Name: SILVER VALLEY LABS, INC.

Case No.: 12334

SAS No."

SDG No.: MHP520

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med):

Lab Code: SILVER

LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				,
ļC	CAS No	: : Analyte	: Concentration: 	c	Q	M	i ! !
15	7429-90-5	Aluminum	317			; = -	! ! hadf=
		Antimony		Ū		P	!
	7440-38-2				,	F	325
	7440-39-3		782.27			ī P	WIF age
_		Beryllium		֓֞֜֜֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓		īP_	29
	7440-43-9		73.67			; P	באני!
_	7440-70-2		369000			P	
	7440-47-3		2.8			; P	!
-		Cobalt	(5.67)			i P	UF
-		Copper	(6.67)				luf
_		Iron	10200		R	TP-	Uni
	7439-92-1	Lead	68.2		NEX E		300
-		Magnesium				IP_	a de
-		: Manganese				P	l'ar
_		Mercury					LAF
-		Nickel	9.7			P	
		Potassium		===		P	:
_ =		:Selenium :		B :	NW* uK		21¢
: 7	440-22-4	Silver	1.6			; P	i i
17	440-23-5	Sodium	63400	:	73	; P	L.F
17	440-28-0	:Thallium	0.90			F	5 •
17	440-62-2	:Vanadium :	2.7_			P	; 1
17	440-66-6	:Zinc	759_1		. 	P	luar
7		Cyanide :				NR	I
Ι.		! ;		_ [t i
_							

Tolor Sefore: YELLOW

Clarity Before: CLOUDY

Texture:

Color After: YELLOW

Clarity After: CLOUDY

Artifacts:

EPA SAMPLE NO.

INDRGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS, INC.

6-68-0074

MHP534

Lab Code: SILVER

Case No.: 12334

SAS No.:

SDG No.: MHP520

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med):

LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

,					
CAS No.	; !	i I Calabana kun niki sani	: : :C:	i ! M	i 1
TCAS NO.	, whatyte .	Concentration 	1 1	1 171	1
17400-00-6	1 4 1	/44.6]	'	-¦=-	l Uti:
7429-90-5					
7440-36-0			B _ CB	<u>-∔₽</u> -	191F
7440-38-2			TIVM	. <u>↓E</u> _	28
1 <u>7440-39-3</u>			BI GB	<u>. </u>	age .
	: <u>Beryllium</u> :	<u>1.1</u> _	: <u> </u>	<u>.:P</u> _	49
17440-43-9	Cadmium_	10.3	! _ <u> </u>	<u> </u>	y_AF
1 <u>7440-70-2</u>	Calcium_	205000	<u> </u>	<u> </u>	LHF
17440-47-3	Chromium	2.8	UI	: ዖ	1
17440-48-4		13.17	B' UB	P	LUIF
	Copper	72.7		; P	ا انون ا
	Iron	(31.5)		; P	1-10
	Lead		BINK W.); F	DIAF
	Magnesium		13	; P	LUIF 89
17439-96-5			13		iur
	Mercury		UNR	TCV	3 SE LAF
	Nickel	9.7	U:	P	
	Potassium	3180]	B 1 1.10	1 P	1-11-
	Selenium :		B' N4 615	١F	liak 🗡 -
	Silver	1.6	UI	18	;
17440-23-5			13	; P	line
	Thallium	0.90	111	F	
	: <u>Vanadium</u>	2.7		TP-	!
	Zinc	2970 ¦		TP-	! ' Are
		<u></u>	- 	INR	
	CASUIDS			1111	# !
'	' ;	i	_ '	'	•

Color Sefore: COLORLESS

Clarity Before: CLEAR

Texture:

Color After:

COLORLESS

Clarity After: CLEAR

Artifacts:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS, INC.

Case No.: 12334

SAS No

SDG No.: MHP520

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med):

Lab Code: SILVER

LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	: : Analyte	: Concentration: 	ic: a	i M	i ! !
7429-20-5	Aluminum	[61.1]	P 1 3		LAF
<u> 7440-36-0</u>	: Antimony_	19.9		<u> </u>	· m ·
1 <u>7440-38-2</u>	Arsenic	: <u>[5.6]</u> :		<u>LF</u> _	MAB. HE
17440-39-3	Barium	<u> [56.0]</u>	सः एष	<u>: P</u> _	PODIF
17440-41-7	:Beryllium:	· <u>`1.1</u>	<u> </u>	<u> </u>	1 289
17440-43-9	: Cadmium	10.3	1 13	<u> </u>	
17440-70-2	:Calcium_	205000	<u>: 18</u>	<u>: P</u> _	LAF
17440-47-3	Chromium	2.8	<u>U1.</u>	<u>:P</u>	1
17440-48-4	Cobalt	[3.5]	BINB	<u>:P</u> _	l:Af
:7440-50-8	:Copper	[4.9]	Blub	<u>: P</u> _	l af
17439-89-6	(Iron	496	_:B	<u> </u>	Bank 1
17439-92-1	:Lead	25.2	INS	NF_	JIF
17439-95-4	: Magnesium:	40300 (13	<u>: P</u>	ا لمنا
	: Manganese :	/1080	13	<u> </u>	
17439-97-6	Mercury :	0.20	UINR	:CV	MASIAF
17440-02-0	Nickel :	(10.6)	K!	<u>: P</u>	
17440-09-7	:Potassium:	<u>_3380</u>];	B: Cas	<u>: 2_</u>	ichi -
17782-49-2	:Selenium_:	1.2	U!NW*	LF_	!
17440-22-4	Silver	1.6	<u>U:</u>	<u>: P_</u>	;
17440-23-5	Sodium :	41900 (1	<u>: P_</u> :	;
17440-28-0	Thallium :	0.90 :	U1	LE_	!
17440-62-2	:Vanadium :	2.7		<u> </u>	1
17440-66-6	Zinc :	3130	; [3	LP_	1
	Cyanice :			NR	}
		,			
· 					

Color Before: COLORLESS

Clarity Before: CLEAR

Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:



EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS, INC.

Contract: 4-108-0014

MHP537

Lab Code: SILVER

Case No.: 12334

SAS No.: (%)

SDG No.: MHP520

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med):

LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

 CAS No.	: Analyte	: Concentration:		: :M	!
: :	!	. Concent attori	!!	!	•
7429-90-5	Aluminum	[49.5]	B Cris	; - -	LHF
:7440-36-0		19.9		<u> </u>	1 2
:7440-38 - 2		2.3		IF_	9
17440-39-3	Barium	[54.3]	BY UB	<u>: P_</u>	14160
17440-41-7	Beryllium:			LP_	; <i>"</i>
1 <u>7440-43-9</u>	<u>Cadmium</u>	13.3		<u>: P_</u>	
~~~~~~~	<u>Calcium</u>	228000		<u> 12</u> _	じょう
	: <u>Chromium</u>	<u>2.9</u>		12_	;
	: <u>Cobalt</u>	<u>[6.6]</u>		<u> </u>	
	Copper	[3.9]		<u> </u>	_
	Iron	346_			The same
	<u>Lead</u>	<u>8.8</u> _		<u>ie</u>	THE THE PARTY OF T
	Magnesium		<u> </u>	<u> </u>	HAP - 67
	Manganese	<u> </u>		12	الله المالية
	Mercury			ŤĞΖ	OSCILATE.
	Nickel	9.7		<u> </u>	3
	<u>Potassium</u>			<u> </u>	,
	<u>Sejauino</u>		BINM* my		
	<u>Silver</u>	1.6		<u> </u>	i 
	Sodium	48000		<u></u>	iute '
	Thallium	<u>0.90</u> _		iE-	i
	: <u>Vanadium</u>	2.7		<u>: P</u> _	1 11 46
	Z <u>inc</u>	<u>3880_</u> ;		; <u>P</u>	
<u> </u>	CX901G6			<u>¦NR</u>	\$ 1
'				'	•

Color Before: COLORLESS

Clarity Before: CLEAR

Texture:

Color After:

COLORLESS

Clarity After: CLEAR

Artifacts:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS, INC.

68-W8-0074:

Lab Code: SILVER

Case No.: 12334

18/cop day SAS No .:

SDG No.: MHP520

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med):

LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	:   Analyte	:  Concentration	C	: : ធ្	   M	:
; ;7429-90-5		29.07			 	l Lau
	Antimony		u i		<u> </u>	1
	Arsenic	2.3	====		:E	330
	Barium	(1.7)			:2	A SAL
	Beryllium		Ū.		<u> </u>	; <b>*</b>
	Cadmium	1.0			; P	1
	Calcium :	11097	87	ંત <b>ે</b>	; P	1616
	Chromium :	2.8	Ū.		<u> </u>	1
7440-48-4	Cobalt :	2.6	<u>u:</u>		<u> </u>	:
7440-50-8	Copper:	1.1	<u>U.</u> :		<u>: P</u> _	1
17439-89-6_3	Iron :	(33.47)	B7	43	<u> </u>	200
1 <u>7439-92-1</u>	Lead	11.37				100
17439-95-4_1	<u>Magnesium</u> :	38.67	21		<u> </u>	المان المان
	Manganese:	12.01			<u> </u>	ا الله
	Mercury;	0.20			ΤĒΖ	320 AF
	Nickel	<u>9.7.</u>			<u> </u>	(ap)
=========	<u>Potassium</u> :				<u> - E</u>	45
<u>  7782-49-2</u>	Selenium_!	1.2			<u> </u>	i i
( <u>7440-22-4</u> )	Silver	1.6			<u>: P</u> _	i ¦≒are
	Sodium :	[41.8]			: F	111
<u>  7440-28-0_ </u>    7440-62-2	Thallium !	0.90			<u></u>	! !
	<u>Vanagium</u> :	<u>2.7</u>			- <del>-</del> -	!Lac
	Cyanide :		#4		NR	
` '	-721170E;	· · · · · · · · · · · · · · · · · · ·				! !

Color Before: COLORLESS

Clarity Before: CLEAR

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

∵omments:



EPA SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS, INC.

Contract: 60 B3 0071

MHP538

Lab Code: SILVER

Case No.: 12334

SAS No.

SDG No.: MHP520

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med):

LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

					,
CAS No.	: ! Analyte :	: Concentration	ici a	M	4 * *
Z429-90-5	Aluminum	29.67		<u> </u>	 
7440-36-0	Antimony	20.1		<u> </u>	) प्रतिष्
7440-38-2	Arsenic		: ロ・ <b>ズ</b> M	<u>:F</u>	395
7440-39-3	Barium	51.1	BIUS	<u>: P</u>	202/2
7440-41-7	Beryllium	1.1	: <u>U1</u>	<u> </u>	· 6
7440-43-9	:Cadmium_	13.5	: _ <u>1</u>	<u>; p</u> _	luif /
7440-70-2	:Calcium	218000	113	<u>; p</u>	lusir
7440-47-3	Chromium	2.8	ıuı	<u> </u>	:
7440-48-4	Cobalt	[5.3]	Blus	<u>: P</u>	; unf
7440-50-8	Copper	11.57	Blub	<u>, p</u>	
	Iron	43.7	18146	<u> </u>	1645
	Lead	0.90	L KWA LI	; F	100
	: <u>Magnesium</u> :	39900	3	<u> </u>	Little 9
	Mancanese		6	18	l Linii
	Mercury	0.20	IUIN R	ICV	: 320 LAF
	Nickel	9.7		; p	96
	Potassium	3570	B156	; 2	luni- Pag
========	Selenium	18.0	18 1 NW * · ·	: F	-111"
	Silver	1.6		; 2	# !
7440-23-5		46400	। ।हे	; P	lur <del>ř</del>
7440-28-0	Thallium	0.90	; Ū ;	; F	1
7440-62-2	:Vanadium	2.7		; P	;
7440-66-6		3720		; P	たけら
	Cyanide			INR	:
					1

Color Sefore: COLORLESS

Clarity Before: CLEAR

Texture:

Color After:

COLORLESS

Clarity After: CLEAR

Artifacts:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS, INC.

Lab Code: SILVER

Case No.: 12334

PS Kop, dan

SDG No.: MHP520

Matrix (soil/water): WATER

Lab Sample ID:

- Level (low/med): LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.			,	! !		:
	CAS No.	Analyte :	Concentration	ici a	M	
T440-36-0   Antimony   19.9   U    IP   T440-38-2   Arsenic   2.3   U  NW   IF   T440-39-3   Barium   1.3   U    IP   T440-41-7   Beryllium   1.1   U    IP   T440-43-9   Cadmium   1.2   U    IP   T440-47-3   Chromium   2.8   U    IP   T440-47-3   Chromium   2.8   U    IP   T440-48-4   Cobalt   2.71   Brud   IP   Car   T440-50-8   Copper   1.1   U    IP   T433-89-6   Iron   132.21   Brud   IP   T433-92-1   Lead   0.90   U  NW   IF   T433-95-4   Magnesium   1.27.81   Brud   IP   T433-95-4   Magnesium   1.41   Brud   IP   T433-97-6   Mercury   0.20   U  N   R   CV   T440-02-0   Nickel   9.7   U    IP   T440-02-0   Nickel   9.7   U    IP   T440-22-4   Selenium   1.2   U  NW   IF   Car   T782-49-2   Selenium   1.2   U  NW   IF   Car   T7440-23-5   Sodium   1.3   31   Brud   IP   T440-23-5   Sodium   1.3   31   Brud   IP   T440-23-5   Sodium   1.3   31   Brud   IP   T440-62-2   Vanadium   0.90   U    IF   T440-62-2   Vanadium   0.90   U    IP   T440-62-2   Vanadium   0.90   U    IP   T440-66-6   Zinc   1.3   U    IP   T440-66-6   Zinc   IP   T440-66-6   Zinc   IP   Zinc   Zi	7429-90-5	Aluminum	[27.0]	Z: 1,13	<u> </u>	144
			19.9	<u> </u>	<u>: P</u>	300
			2.3	U I NW	<u>: F</u>	100
			1.3	U:	<u>; P</u>	* ************************************
	17440-41-7	Beryllium	1.1	<u> </u>	<u> </u>	;
				ıu:	<u> </u>	;
			(90.8)	81 UB	<u> </u>	iui-
			2.8	U:	<u>: P</u> _	i
			<u> </u>	EC! WIS	<u> </u>	KAF
7439-89-6   Iron			1.1	U.	:P_	}
			132.2]	B 1 413	<u> </u>	سينخزا
	17439-92-1	Lead	0.90	LINMY	LF_	2
			<u> </u>	\$ 1 W.19	_ <u></u>	146 39
				Blue	<u> </u>	LUE
				UINR	<u>.cv</u>	LAF
1.2   U  NW*   IF   W    1.440 - 22 - 4   Silver			9.7			a
7782-49-2   Selenium	17440-09-7	<u>Potassium</u>	14371	<u> 폴네노</u>	12_	المحروب علاا
7440-23-5   Sodium	17782-49-2	Selenium	1.2	<u> </u>	LLE_	
	17440-22-4	Silver :				:
7440-62-2	! <u>7440-23-5</u>	Sodium	113.37	<u> R:                                   </u>	<u>1P_</u>	1.46
7440-66-6  Zinc    1.3  U     IP	1 <u>7440-28-0</u>	: Thallium :	0.90	n:	_ <u>:F</u> _	!
	<u>7440-62-2</u>	<u> Yanadium                                    </u>				1
Cyanide	1 <u>7440-66-6</u>	Zinc	1.3	n:	_ <u>:P</u> _	<u> </u>
	!	Cyanide :			<u>INR</u>	;
!		! ;		_;	_:	1 *

( /lor Refore: COLORLESS -

Clarity Before: CLEAR Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

L_mments:

#### REGION VIII SUMMARY OF DATA QUALITY ASSURANCE REVIEW

# ***guideline references are from Contract #787***

Case No.: 12334 TDD No.: F08-8909-08

Site: Richardson Flats

Contractor Laboratory: Keystone-Houston

Data Reviewer: Annette Sackman Date of Review: 10-3-89

Sample Matrix: 19 Low Waters

Analysis: Mercury

Sample Nos.: MHP520, MHP521, MHP522, MHP523, MHP524, MHP525, MHP526,

MHP527, MHP528, MHP529, MHP530, MHP532, MHP533, MHP534,

MHP535, MHP537, MHP538, MHP539, MHP540

- (X) Data are acceptable for use.
- ( ) Data are acceptable for use with qualifications noted.
- ( ) Data are preliminary pending verification.
- ( ) Data are unacceptable.

Action required by DPO?

No X Yes The following items require action:

Action required by project officer?

No X Yes

The following are our findings:

All requirements were met for the mercury analysis except Form VII - Laboratory Control Sample was not included. Since the LCS was analyzed and reported in the raw data and met all other requirements, no action is taken.

#### Inorganic Data Completeness Checklist

- X Inorganic analysis data (Form I)
- X Initial calibration and continuing calibration verification (Form IIA)
- CRDL standard for AA and ICP (Form IIB)
- X Blanks (Form III)

ICP interference Check sample (Form IV)

X Spike sample recovery (Form VA)

Post digestion spike sample recovery (Form VB)

- X Duplicates (Form VI)
- X Laboratory control sample (Form VII)

Standard addition results (Form VIII)

ICP serial dilutions (Form IX)

- X Holding times (Form X)
- X Instrument detection limits-quarterly (Form XI)
- X ICP interelement correction factors-quarterly (Form II)
- X ICP linear ranges-quarterly (Form XIII)

Raw data for interference checks

- X Raw data for calibration standards
- X Raw data for blanks

Raw data for CRI and/or CRA

- X Raw data for samples
- X Raw data for duplicates
- X Raw data for spikes
- X Traffic reports

# Contract Compliance

- I. Initial and Continuing Calibration Verification (ICV and CCV) (guidelines pg. E-4, Form IIA)
  - 1. Was instrument calibrated daily and each time it was set up?

    yes X no
  - 2. Were instruments calibrated using 1 blank and several standards?
    yes X no
  - 3. Were calibration verifications within 90-110%? yes X no
  - 4. Were continuing calibrations run at 10% frequency?

    yes X no
- 5. Were the raw data correctly transcribed onto Form IIA?

  yes X no

  Comments: All requirements met.
- II. CRDL Standards for ICP (CRI) and/or AA (CRA) (guidelines pg. E-6, Form IIB)
  - 1. For ICP analysis, were standards (CRI) @ 2x the CRDL or the IDL (whichever was greater) analyzed at the beginning and the end of each sample run, or at a minimum of twice/8 hour shift, whichever was more frequent?

yes no

- 2. For furnace AA analysis, were standards (CRA) analyzed at the beginning and the end of each sample run, or at a minimum of twice/8 hour shift, whichever was more frequent?
- 3. Were the CRI and/or CRA standards analyzed after the ICV? yes no
- 4. Were these data reported on Form IIB?

  yes no
- 5. Were the raw data correctly transcribed onto Form IIB?
  yes no
  Comments: Not required.

# III. Blanks (guidelines pg. E-6, Form III)

- 1. Was the initial calibration blank (ICB) analyzed immediately after the initial calibration verification (ICV)?

  yes X no
- Was a continuing calibration blank (CCB) analyzed immediately after each continuing calibration verification (CCV)? yes X no
- 3. Was a preparation blank (PB) analyzed at a frequency of at least 1 in 20 samples?

  yes X no NA
- 4. How many elements were detected above the CRDLs? 0 (if 0, go to question 5)
  - 4a. How many elements were detected in the blanks at greater than one-half the amount detected in any sample?
- 5. Were raw data correctly transcribed onto Form III?

  yes X no

  Comments: All requirements met.
- IV. ICP Interference Checks (ICS) (guidelines pg. E-7, Form IV)
  - 1. Was the ICS analyzed twice per 8 hour shift?

    yes

    no
  - 2. Were the ICSs analyzed before and after samples? yes no
  - 3. Was any massive interference detected? yes no
  - 4. Were the ICSs within ±20% mean value?

    yes

    no
- 5. Were raw data correctly transcribed onto Form IV?
  Comments: Not required.

V. Spike Sample Analysis (S) (guideline pg. E-8, Form V)

- 1. Were spikes analyzed at a frequency of 1 in 20 samples?

  yes X no
- 2. Were spike recoveries correctly calculated?

  yes X no

$$x = \frac{(SSR - SR)}{SA} \times 100$$

SSR = Spiked Sample Result

SR = Sample Result

SA = Spike Added

3. Were spike recoveries within the range of 75-125%? yes X no

3a. For recoveries outside this range, were associated data flagged "N" by the laboratory on Forms I and V?

yes no NA X

(an exception if granted where the sample concentration is >4X
 the spike concentration)

- 4. Were raw data correctly transcribed onto Form V?

  yes X no
- * Refer to page E-9 (SOW 787) for information regarding the amount of spike to be added for each analyte and for other information about the Spike Sample Analysis.

Comments: All requirements met.

VI. Duplicates (D) (guidelines pg. E-11, Form VI)

- 1. Were duplicates analyzed at a frequency of 1 in 20 samples? yes X no
- 2. Were RPDs correctly calculated? yes X no

$$RPD = \frac{S - D}{(S + D)/2} \times 100$$

S = Sample

D = Duplicate

- 3a. For sample concentrations >5x the CRDL, were RPDs ±20%? (limits of ±35% apply for soil/sediment/tailings samples)

  yes X no NA
- 3b. For sample concentrations >5x the CRDL, did duplicate analysis results fall outside the control window of ± the CRDL?

  yes no X NA
- 3c. Where the RPDs exceeded the control limits, were the data flagged '*' on Forms I and VI by the laboratory?

  yes no NA
- 4. Were raw data correctly transcribed onto Form VI? yes X no
- * Other Considerations:
- Field blanks cannot be used for duplicate analyses
- Duplicates must be analyzed for each analytical method

Comments: All requirements met.

- VII. Laboratory Control Sample (LCS) Analysis (guideline pg. E-12, Form VII)
  - 1. Was an LCS analyzed for every sample delivery group or batch of samples, whichever was more frequent? yes X no
  - 2. Were recoveries within the 80-120% limit?

    yes X no

-if the recoveries were outside this range the analysis must be terminated, the problem corrected and the previous samples associated with that LCS redigested and reanalyzed.

3. Were the raw data correctly transcribed onto Form VII? yes no X

Comments: Form VII was not included in the data package, however, the LCS was analyzed and met contract requirements, therefore, no action is taken.

# VIII. Furnace Atomic Absorption (AA) QC Analysis (guidelines pg. E-14, Form VIII)

1. Does the raw data package contain absorbance values for two injections per sample, the average values and the relative standard deviation (RSD)?

yes

no

 For analyte concentrations > the CRDL, did the RSD for the duplicate injections agree within 20%? (if yes, go to question 3)

yes

no

 $RSD = \underbrace{SD}_{M} X 100$ 

SD = Standard Deviation of Duplicate Injections

M = Mean of Duplicate Injections

2a. Were samples that exceeded the 20% criteria reanalyzed?

yes

no

2b. Did any reanalyzed samples exceed the 20% criteria? yes no

yes

no

3. Was the recovery of the spike > 40%? (if yes, go to question 4).

yes

no

If no, was the sample diluted and rerun with another spike?

yes

no

4. Was sample absorbance 50% of spike absorbance?* (if yes, go to question 5).

yes

no

* Spike absorbance = absorbance of spiked sample - absorbance of sample.

4a. For spike recoveries between 85 and 115%, were results reported to the IDL?

yes no

 $RPD = \underbrace{(SSR - SR)}_{SA} \times 100$ 

SSR = Spike Sample Recovery

SR = Sample Result

SA = Spike Added

- 4b. For spike recoveries outside the 85 and 115% range, were results reported to the IDL and flagged with 'W'?

  yes no
- 5. Was spike recovery between 85 and 115%? (if no, go to question 6)
  - 5a. Were results quantified from calibration curve and reported to IDL?

yes no

6. Was an MSA at 50, 100 and 150% of the sample absorbance analyzed?

yes no

- 6a. Was each MSA analysis identified in the raw data along with the slope, intercept and correlation coefficient? yes no
- 6b. Were these data correctly transcribed onto Form VIII?

  yes

  no
- 6c. Were correlation coefficients(r) > 0.995?

  yes

  no
- 6d. If no, were MSAs run once more?

  yes

  no
- If the correlation coefficients were still > 0.995, data on Form I must be from the run with the best 'r' and the data on Forms I and VII must be flagged with a '+'.

Were these criteria met?

yes

no

6e. Were all MSA obtained data marked with an 'S' or an S+-on-form I?

yes no

Comments: Not required.

- IX. ICP Serial Dilution (L) Analysis (guidelines pg. E-12, Form IX)
  - 1. Was an ICP serial dilution performed on each group of samples of a similar matrix (i.e., soil, water) and concentration (i.e., low, high) or for each sample delivery group, whichever was more frequent?

yes no

2. For elements with concentrations >10% the CRDL, did any exceed the serial dilution results by more than 10%? (if no, skip questions 3 and 4)

ves no

 $% \frac{I-S}{I} \times \frac{I-S}{I} \times 100$ 

I = Initial Sample Result

- S = Serial Dilution Result (instrument reading X5)
- 3. Which elements had concentrations that exceeded the 10% criteria?
- 4. Did the laboratory flag these data with an 'E' on Form IX?

  yes

  no
- 5. Were the raw data correctly transcribed onto Form IX?

  yes

  no

Comments: Not required.

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- X. Instrument Detection Limits (IDL) (guidelines pg. E-13, Form XI)
  - 1. Were IDLs reported for each analyzed element?

    yes X no
  - 2. Were IDLs reported for each instrument used?

    yes X no
- 3. Did the IDLs meet the contract requirements? (refer to pg. E-13, SOW 787)

  yes X no

Comments: All requirements met.

- XI. Interelement Corrections for ICP (guidelines pg. E-13, Form XII)
  - 1. Were correction factors reported on Form XII? yes X no

Comments: All requirements met.

- XII. Linear Range Analysis (LRA) (guidelines pg. E-14, Form XII)
  - Was a linear range verification standard analyzed? yes X no
  - 2. Was the results within  $\pm 5\%$  of the true value? yes no

# Holding Times .

Limits: Metals - 6 months; Hg - 30 days; Cn - 28 days.

- Verified date of sample receipt by laboratory 7-21-89
   Date of preparation/analyses 8-3-89
- 3. Were holding times met? yes X no

Analyte	Matrix	Date Sampled	Prep Date	Holding Time	Holding Time Limit/Met	
Mercury	Low Water	7-18-89	8-3-89	16 days	30 days yes	

# Keystone 12334-8-5-

# U.S. EPA - CLP

7 %

Comments:

•		INGGGANIC	1 A <b>nalysis</b> data s	UEET	EPA SAMPLE NO.	
					MHP520	
Lab Name: KE	YSTONE ENVIR	ONMENTAL	Contract: 6	000-8W-8	5	
Lab Code: k	ŒYTX Ca	se No.: 12:	334 SAS No.:		SDG No.: MHP520	
Matrix (soil/water): WATER Lab Sample ID: 890774002						
Level (low/m	ned): LOW	1		Date Rec	eived: 07/21/89	
% Solids:	0					
		11 . 1		والمستوسية والمساور	65. UC //	
			ug/L or mg/kg d			
	1	1	•	1 1	1 1	
	CAS No.		Concentration		M   _{;	
	7429-90-5		 			
	17449-36-0	Antimony		· ·	INR I	
	17440-36-0 17440-38-2	Arsenic			INR :	
	17440-39-3	Barium	}	1 1	INR I	
	17440-41-7			1 1	INR	
	17440-43-9	•		: :	INR :	
	17440-70-2			: :	INR	
	17440-47-3	Chromium	1	: :	INR I	
	: <b>7</b> 440 -48 -4	Cobalt	•	: :	:NR :	
	17440-50-8	:Copper		: :	INR :	
	17439-89-6			: :	INR :	
	17439-92-1	Lead	}	1 1	INR I	
	17439-95-4			: :	INR I	
	17439-96-5	Manganese	}		INR I	
	:7439-97-6	Mercury	. 0.20		:CV :	
	1 <b>7439-</b> 02-0			1 1	INR I	
	17440-09-7			: :	NR :	
	17782-49-2			1 1	INR I	
	17440-22-4			1 1	INR 1	
	17440-23-5			<b>!</b> !	INR 1	
	17440-28-0			1 1	INR I	
	17440-62-2	Vanadium_			INR !	
	! <b>7</b> 440-66-6	Zinc		: !	INR I	
		Cyanide		; ;	INR   	
	·	·		'	- ' '	
Color Before:		Clarity	Before:		Texture:	
Color After:		Clarity	After:		Artifacts:	

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# Keystone 12334-8-5

#### U.S. EPA - CLP

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. INORGANIC ANALYSIS DAT Lab Name: KEYSTONE ENVIRONMENTAL Contract:	MHP521
The state of the s	
Lab Code: KEYTX Case No.: 12334 SAS N	No.: SDG No.: MHP520
Matrix (soil/water): WATER	Lab Sample ID: 890774005
Level (low/med): LOW	Date Received: 07/21/89
% Solids: o	
Concentration Units (ug/L or mg/k    CAS No.	C
Color Before: Clarity Before:	Texture:
Color After: Clarity After:	Artifacts:
Comments:	

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### U.S. EPA - CLP

Lab Name: KE	YSTONE ENVIR		ANALYSIS DATA S Contract: 6			5	MHP522
Lab Code: K	EYTX Ca	se No.: 12	324 S <b>as</b> No.:			SDG	No.: MF
Matrix (soil	/water): WA1	ER		Lat	Samp	le ID:	: 8 <b>9</b> 0774
Level (low/m	ed): LOW	l		Dat	e Rec	eived:	07/21/
% Solids:	0						
	Concentrati	on Units 🤃	ug/L or mg/kg c	iry	weigh:	t): U	3/L
	!			7-7			-
	CAS No.	Analyte	Concentration	:::	Q		
	7429-90-5	101		•¦-¦		NR	} 1
	17440-36-0	'Artimony	 	!!	•	INR	
	17440-38-2	'Areanic	! !	1 !		INR	
	17440-39-3	!Barium	!	!!		INR	
	17440-41-7	Beryllium:	\ •			: NR	
	17440-43-9			; ;		NR :	
	17440-70-2					NR .	
	17440-47-3			: i		INR	
	17440-48-4			1 1		INR	
	17440-50-8			1 1		INR :	
	17439-89-6			1 1		INR	
	17439-92-1			: :		INR :	
	17439-95-4			1 1		INR :	
	17439-96-5			: :		INR :	
	17439-97-6	Mercury	0.20	:0:		ICV :	
	17439-02-0			: :		INR :	
	17440-09-7			1 1		INR :	
	17782-49-2	Selenium_		! !		INR	
	17440-22-4	Silver		1 1		INR :	
	17440-23-5	Sodium				INR :	
	17440-28-0	Thallium_				INR :	
	17440-62-2	[Vanadium_		1 1		INR I	
	17440-66-6			! !		INR :	
		Cyanide  		; ; ;_;		INR :	
Color Before:		Clarity	Before:			Textu	re:
Color After:		Clarity	After:			Artif	acts:
Comments:							

### U.S. EPA - CLP

Lab Name: KEYSTONE E	INORGANIC ANALYSIS DATA  NVIRONMENTAL Contract:	1 MHP523
Lab Code: KEYTX  Matrix (soil/water):	Case No.: 12334 SAS No.	
<pre>Level (low/med): % Solids:</pre>	L <b>OW</b>	Date Received: 07/21/89

Concentration Units (ug/L or mg/kg dry weight): UG/L

: :CAS No.	: Analyte	: :Concentration	101	Q	; ; ;
!	!	!	1		
7429-90-5	Aluminum_	'	`i-i-		INR
17440-36-0			: :		INR :
17440-38-2	· <del>-</del>	! !	: :		INR :
17440-39-3		<b>!</b>	; ;		INR :
17440-41-7	Beryllium	<b> </b>	; ;		INR :
17440-43-9	Cadmium	! !	: :		INR :
17440-70-2	Calcium		1 1		INR :
17440-47-3			1 1		INR :
17440-48-4	Cobalt	<u> </u>	1 1		INR :
17440-50-8	Copper		1 1		INR :
:7439-89-6	Iron		1 1		INR :
17439-92-1	Lead	}	1 1		INR :
17439-95-4	Magnesium		1 1		INR :
17439-96-5	Manganese		: :		INR :
17439-97-6	Mercury	0.20	: 11:		CV :
17439-02-0	!Nickel	!	: :		INR :
17440-09-7	Potassium	•	1 1		INR :
17782-49-2	Selenium_		1 1		INR :
17440-22-4	:Silver	!	: :		INR :
17440-23-5	Sodium		; ;		INR :
17440-28-0	!Thallium_	<b>!</b>	1 1		INR :
17440-62-2	:Vanadium_	<b>!</b>	: :		INR :
17440-66-6	Zinc	1	1 1		INR :
1	Cyanide	<b>;</b>	; ;		INR I
		' '	!_!.		_''

Color	Before:	Clarity	Before:	Texture:
Color	After:	Clarity	After:	Artifacts:
Commer	nts:			

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### U.S. EPA - CLP

Lab Name: KE	YSTONE ENVIR		1 A <b>NAL</b> YSIS DATA : Contract: (		EPA SAMPLE NO.
Lab Code: K	EYTX Ca	se No.: 12	234 SAS No.:	•	SDG No.: MHP520
Matrix (soil	/water): WAT	ER		Lab Sample	P ID: 890774008
Level (low/m	ed): LOW	1		Date Recei	ived: 07/21/89
% Solids:	o				
	CAS No.	! ! Analyte	ug/L or mg/kg o    Concentration	[	
	7429-90-5   7440-36-0   7440-38-2   7440-39-3   7440-41-7   7440-43-9   7440-47-3   7440-48-4   7440-50-8   7439-92-1   7439-95-4   7439-95-4   7439-97-6   7439-97-6   7439-97-6   7439-97-6   7440-22-4   7440-23-5   7440-28-0   7440-66-6	Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury Potassium Selenium Silver Sodium Thallium	11.50		NR :
Color Before:		Clarity	Before:	т	exture:
Color After:		Clarity	After:	A	rtifacts:
Comments:					w
				<b></b> _	

SAS No.:

### U.S. EPA - CLP

/ INORGANIC ANALYSIS DATA SHEET !	
Lab Name: KEVSTONE ENUIRONMENTAL Contract: 68-W8-0005	MHP525

Case No.: 12334

KEYTX Matrix (soil/water): WATER

SDG No.: MHP520

Level (low/med):

Lab Sample ID: 890774009

Date Received: 07/21/89

% Solids:

Lab Code:

0

LOW

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	: Analyte	  Concentration	; ; C ;	a	: M :
'		¹	!-:		NR
	Aluminum_				• • •
17440-36-0			1 1		INR :
17440-38-2					INR :
17440-39-3					INR :
17440-41-7	Beryllium	ĺ	: :		INR
17440-43-9	Cadmium		: :		INR :
17440-70-2	Calcium	1	: :	•	INR :
17440-47-3	Chromium_	}	; ;		INR
17440-48-4	Cobalt	!	: :		INR :
:7440-50-B	Copper	!	1 1		INR :
17439-89-6		i	: :		INR :
17439-92-1		<b>!</b>	: :		INR :
17439-95-4	:Magnesium	1	: :		INR :
17439-96-5	_		: :		INR :
17439-97-6	Mercury	0.20	: U :		ICV !
17439-02-0			: :		:NR :
17440-09-7			; ;		INR I
17782-49-2	Selenium		: :		INR :
17440-22-4	_		: :		INR I
17440-23-5			: :		INR :
17440-28-0					INR :
17440-62-2					INR I
17440-66-6					INR I
		1			NR :
'	Cyanide	) 	• •		!!!
'	· ·	·	' '		''

Color	Before:	Clarity	Before:	Texture:
Color	After:	Clarity	After:	Artifacts:
Commer	nts:			

### U.S. EPA - CLP

			1	CHEET	EPA SAMPLE NO.
		INURGANIC	ANALYSIS DATA	SHEE!	MHP526
Lab Name: N	EYSTONE ENVIR	ONMENTAL	Contract:	6 <b>8-W8-</b> 00 <b>05</b>	
Lab Code:	KEYTX Ca	se No.: 12:	334 S <b>AS</b> No.	:	SDG No.: MHP520
Matrix (soi	il/water): WAT	ER		Lab Sample	ID: 890774010
Level (low/	(med): LOW			Date Recei	lved: 07/21/89
% Solids:	Q.				
	Concentrati	on Units (	ig/L or mg/kg	dry weight:	): UG/L
		 !			
	CAS No.	Analyte	Concentration	ici a	M :
	17429-90-5	Aluminum_		<b>-</b> ; - ; ;	INR I
	17429-90-5 17440-36-0 17440-38-2 17440-39-3	Antimony_	<b>!</b>	1 1	
	17440-38-2	Arsenic	<del>)</del> 1	1 1	
	17440-41-7				
	17440-43-9				NR !
	1 <b>7440-</b> 70 <b>-</b> 2				NR :
	:7440-47-3				NR
	17440-48-4	Cobalt			NR :
	17440-50-8				NR !
	17439-89-6			1.1	
	1 <b>7439-9</b> 2-1	Lead			
	17439-95-4				
	17439-96-5				NR !
	17439-97-6	Mercury	. 0.20		CV !
	17439-02-0				NR :
	17440-09-7			· ·	NR :
	17782-49-2				NR :
	17440-22-4				NR :
	17440-23-5				NR :
	17440-28-0				NR :
	17440-62-2	Vanadium_:			NR (
	:7440-66-6				NR I
		Cyanide:			NR :
	·	' '		-'-''	'
Color Before	:	Clarity	Before:	τ	exture:
Color After:		Clarity	After:	А	rtifacts:
Comments:					

		0.5.	EPA - CLP			
·		INORGANIC	1 ANALYSIS DATA S	HEET	EPA :	SAMPLE NO
ab Name: KE	YSTONE ENVI	RONMENTAL	Contract: 6	8-W8-000	5	
ab Code: K	EYTX Ca	ase No.: 12	234 S <b>AS</b> No.:		SDG	No.: MHP52
						55577.464.4
Matrix (soil	/water): WA	FER		Lab Samp	ile in:	890774011
Level (low/m	ed): LOW	J		Date Rec	eived:	07/21/89
% Solids:	o					
	*					
	Concentrat	ion Units (	ug/L or mg/kg d	ry weigh	t): UG	/L
				: :	<del></del>	
			Concentration	(C: 0	: M :	
				¦-¦	NR	
	17429-90-0	Aluminum_	i 1	1 1	INR :	
	1 <b>7440-36-</b> 0 1 <b>7440-38-</b> 2	'Antimony_	1	1 1	INR	
	17440-30-2	.Arsenic	•		INR I	
	17440-39-3			1 1	INR :	
	17440 -41 -7	•		1 1	INR :	
	17440-43-9			1 1	INR I	
	17440-70-2			1 1	INR I	
	17440-47-3			1 1	INR :	
	17440-48-4 17440-50-8				INR :	
	17440-30-6	'Cobber	!	1 1	INR I	
	1 <b>7439-</b> 89-6 1 <b>7439-</b> 92-1	iron	1	! ! ! !	INR :	
				1 1	INR I	
	7439-95-4   7439-96-5			• • • • • • • • • • • • • • • • • • •	INR :	
	17439-97-6			!!	CV :	
				1 1	NR :	
	17439-02-0   17440-09-7			1 1	NR :	
	17782-49-2			1 1	NR :	
	17440-22-4			!!!	INR :	
	17440-23-5			· ·	INR	
	17440-28-0	'Thallium	1	!!!	INR :	
	17440-62-2			1 1	NR	
	17440-66-6			} }	INR :	
		Cyanide			INR	
		.'	· 	i_i		
olor Before:		Clarit	y Before:		Textu	re:
olor After:		Clarit	y After:		Artif	acts:
omments:						

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### U.S. EPA - CLF

		0.5.	EFF - CEF		
		INORGANIC /	1 Analysis data s	SHEET	EPA SAMPLE NO.
Lab Name: k	EYSTONE ENVIR	ONMENTAL	Contract: 6	58-W8-000	MHP528 
Lab Code:	KEYTX Ca	se No.: 123	334 SAS No.:	:	SDG No.: MHP520
Matrix (soi	.l/water): WAT	ER		Lab Samp	le ID: 890774012
tevel (low/	med): LOW			Date Rece	eived: 07/21/89
% Solids:	. 0				
	Concentration	on Units (	ig/L or mg/kg o	iry weight	e): UG/L
	CAS No.	Analyte	Concentration	ici a	
	17429-90-5 17440-36-0 17440-38-2 17440-41-7 17440-43-9 17440-47-3 17440-48-4 17440-50-8 17439-89-6	Aluminum_ Antimony_ Arsenic Barium Beryllium Cadmium Calcium_ Chromium_ Cobalt Copper		1 1	INR   INR   INR   INR
	7439-92-1    7439-95-4    7439-96-5	Lead Magnesium Manganese Mercury Nickel Potassium Selenium_ Silver Sodium	. 0.20	: : : U: : : : : : : : :	INR : INR : INR : ICV : INR :
Color Before	7440-62-2  7440-66-6 	Vanadium_  Zinc  Cyanide  Clarity	Before:		INR : INR : INR : INR : I Texture:
Color After:		Clarity	After:		Artifacts:
Comments: 					

### U.S. EPA - CLP

•	INDRGANIC AN	1 N. VOIC DATA	CUEET	EPA SAMPLE NO.
	INURGANIC AM	ACISIS DATA	SHEET	MHP529
Lab Name: KEYSTONE E	NV I RONMENTAL	Contract:	68-W8-0005	 
Lab Code: KEYTX	Case No.: 1233	SAS No.	:	BDG No.: MHP520
Matrix (soil/water):	WATER		Lab Sample	ID: 890774013
Level (low/med):	LOW		Date Recei	ved: 07/21/89
% Solids:	0			

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	   Analyte 	  Concentration 	: . : : : : : : : : : : : : : : : : : :	Q 	i M	:
17429-90-5	Aluminum	!	-		INR	;
17440-36-0	Antimony	:	1 1		INR	;
17440-38-2			1 1		INR	- 1
17440-39-3			1 :		INR	1
17440-41-7			1 1		INR	1
17440-43-9			; ;	}	INR	;
17440-70-2			1 1		INR	1
17440-47-3			1 1		INR	;
17440-48-4			; ;		INR	;
17440-50-8			1 1		INR	;
17439-89-6			1 1		INR	1
17439-92-1		<b>!</b>	1 1		INR	ţ
17439-95-4		!	; ;		INR	1
17439-96-5	!Manganese	<b>;</b>	; :		INR	;
17439-97-6	-		:01		: CV	;
17439-02-0			1 1		INR	ţ
17440-09-7			1 :		INR	1
17782-49-2	!Selenium_	!	: :		INR	1
17440-22-4	Silver	 	: :		: NR	ł
17440-23-5	Sodium	}	: :		! NR	1
17440-28-0	Thallium_	<b>!</b>	: :		: NR	1
17440-62-2	!Vanadium_	<b>!</b>	: :		: NR	;
17440-66-6	:Zinc	<b>!</b>	: :		: NR	ľ
!	Cyanide	!	: :		INR	1
!	1	' '	1_:		!	. !
				— —		

COTOR	percre:	Claricy	perore.	ichou. c.
Color	After:	Clarity	After:	Artifacts:
Commen				

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### U.S. EPA - CLP

Lab Name:	KEYSTONE E	INORGAN	1 DIC ANALYSIS DAT	A SHEET	EPA SAMPLE NO.
-					COO No MUDEOO
Lab Code:	KEYTX	Case No.:	12334 SAS N	o.:	SDG No.: MHP520
Matrix (sc	il/water):	WATER		Lab Sample	∍ ID: 890774014
Level (low	/med):	LOW		Date Rece	ived: 07/21/89
% Solids:		O.			
	Concent	ration Unit	s (ug/L or mg/k	g dry weight:	: UG/L

•	  CAS No. 	:   Analyte 	  Concentration 	C	: : M :	
	17429-90-5	Aluminum		; -;	 INR	- ;
	17440-36-0			1 1	INR	;
	17440-38-2		}	: :	INR	;
	17440-39-3			: :	INR	;
	17440-41-7			: :	INR	;
	17440-43-9	•		: :	INR	ŀ
	17440-70-2			: :	INR	!
	17440-47-3			: :	INR	1
	17440-48-4			: :	INR	;
				1 1	INR	;
	! <b>743</b> 9-89-6			: :	:NR	ţ
	17439-92-1			: :	INR	1
	17439-95-4			: :	INR	;
	:7439-96-5			1 1	INR	;
	:7439-97-6			:ប:	: CV	ť
	17439-02-0			: :	INR	ł
	7440-09-7	:Potassium:		: :	INR	ł
	17782-49-2	Selenium_		1 1	INR	;
	17440-22-4	Silver		: :	INR	1
	17440-23-5	Sodium		: :	! NR	1
	17440-28-0			: :	INR	;
	17440-62-2	Vanadium_		1 1	INR	í
	17440-66-6	Zinc		: :	: NR	;
	Í	Cyanide:		;	INR	1
	!	!;		:_:	 !	. !

Color Before:	Clarity Before:	Texture:
Color After:	Clarity After:	Artifacts:
Comments:		

		U.S.	EPA - CLP		
·		INORGANIC A	1 Analysis data 9	SHEET	EPA SAMPLE NO.
lah Nasa WEW	CTONE CHILLD	CHMENTAL	Contracts (	: III	MHP532
Lab Name: KEY	SIUNE ENVIK	UNMENTAL	Contract: 6	20 -MO -000:	[,] , , , , , , , , , , , , , , , , , ,
Lab Code: KE	EYTX Ca	se No.: 12	334 SAS No.:	1	SDG No.: MHP520
Matrix (soil/	'water): WAT	ER		Lab Sampl	e ID: 890774015
Level (low/me	ed): LOW			Date Rece	eived: 07/21/89
% Solids:	0				
	!		ug/L or mg/kg o	1	:): UG/L
				_!_!	_
	:7429-90-5	Aluminum_	<b>!</b>	1 1	INR
	17440-36-0 17440-38-2	Antimony_	•	1 1	INR I
	17440-38-2	Arsenic		i i	INR I
	17440-39-3			* i i	INR
	17440-41-7	•		1 1	INR   INR
	17440-43-9 17440-70-2			1 1	INR I
	17440-70-2			!!	INR !
	17440-48-4				INR I
	17440-50-8				INR I
	17439-89-6			ii	INR I
	17439-92-1			1 1	INR I
	17439-95-4			: :	INR I
	17439-96-5		1	1 1	INR :
	17439-97-6	Mercury	0.20	lu:	ICV
	1 <b>7439-</b> 02-0	Nickel	<b>!</b>	1 1	INR I
	17440-09-7			1 1	INR :
	17782-49-2			1 1	INR I
	17440-22-4	Silver	!	1 1	INR I
	17440-23-5			1 1	INR I
	17440-28-0			i i	INR :
	17440-62-2			i i	INR :
	17440-66-6			1 1	INR I
		Cyanide	!	.; .; _; _;	11
Color Before:		Clarit	y Before:	_ <del>_</del>	Texture:
Color After:		Clarity	y After:		Artifacts:
Comments:					

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### U.S. EPA - CLP

				•				
		11/000A		1	~		EPA	SAMPLE NO.
I also Manager	1/21/2020			SIS DATA S			1	MHP533
Lab Name:	KEYSTONE E	NVIRONMENTA	al Co	intract: (	> <b>H</b> - 4	48-0002	i	
Lab Code:	KEYTX	Case No.:	: 12334	SAS No.	:		SDG 1	No.: MHP520
Matrix (se	oil/water):	WATER			Lat	Sample	ID:	890774016
Level (lo	w/med):	LOW			Dat	te Recei	.ved:	07/21/89
% Solids:		0						
	I ICAS No	ration Unit	/te  Conc	entration	; ;	; Q ;	; м ;	/L
	7429-9   7440-3   7440-3   7440-4   7440-4   7440-4   7440-4   7440-4   7440-5   7439-9   7439-9   7439-9   7439-0   7440-0   7782-4   7440-2   7440-6   7440-6	0-5  Alumin 6-0  Antimo 8-2  Arseni 9-3  Barium 1-7  Beryli 3-9  Cadmiu 0-2  Calcid 7-3  Chromi 8-4  Cobald 0-8  Copper 9-6  Iron 2-1  Lead 5-4  Mangar 7-6  Marcur 2-0  Nickel 9-7  Potass 9-2  Seleni 2-4  Silver 3-5  Sodium 8-0  Thalli 2-2  Vanadi 6-6  Zinc 	num_  ic  ium  ium  ium  ium  ium  ium  ium  ium_  ium  ium_					
Color Befor	re:	Cla	rity Bef	ore:		т	extur	·e:
Color After	·:	Cla	rity Aft	er:		А	rtifa	acts:
Comments:								

		0.8.	EPA - CLP				
Lah Name: KE'			1 ANALYSIS DATA S Contract: 6			EPA	SAMPLE NO
cao name: KE	1210ME FIAATIV	OMNEMIAL	Contract.		0005	'	
Lab Code: Ki	EYTX Ca	se No.: 12:	334 SAS No.:	<b>:</b>		SDG	No.: MHP52
Matrix (soil.	/water): WAT	ER		Lab :	Sample	e ID:	890774017
Level (low/m	ed): LOW			Date	Recei	ived:	07/21/89
% Solids:	o						
			ug/L or mg/kg c			: UG	/L
		   Analyte	  Concentration 			M	
	17429-90-5 17440-36-0 17440-38-2	Antimony_  Arsenic	 	-	:	NR I	
	17440-39-3 17440-41-7 17440-43-9	Beryllium  Cadmium_	<b>!</b>		; ;	NR I	
	17440-70-2 17440-47-3 17440-48-4	Chromium_  Cobalt	 		· <b>!</b>	NR   NR   NR	
	7440-50-8  7439-89-6  7439-92-1  7439-95-4	:Iron	 		; ;	NR I	
	17439-96-5 17439-97-6 17439-02-0	Manganese  Mercury  Nickel	 	: : : U ! : : !	;	NR   CV   NR	
	17440-09-7 17782-49-2 17440-22-4	Selenium_   Silver	! !		;	NR :	
	17440-23-5 17440-28-0 17440-62-2 17440-66-6	Thallium_   Vanadium_	; ;		;	NR   NR   NR   NR	
	1	Cyanide		.; _!	1	NR	
Color Before:		Clarity	y Before:		Т	extu	re:
Color After:		Clarity	After:		A	artifa	acts:
Comments:		••					

FORM I - IN

### U.S. EPA - CLP

		TNOOGAN	1 IC ANALYS	IC DATA	CUEET	EPA SAMPLE NO.
		INUKUAN	ILL ANALTS	IS DWIN	SHEET	: MHP535
Lab Name:	KEYSTONE	ENVIRONMENTA	L Con	tract:	68-W8-0005	
Lab Code:	KEYTX	Case No.:	12334	SAS No.	:	SDG No.: MHP520
Matrix (so	oil/water)	: WATER			Lab Sample	P ID: 890774018
Level (lov	w/med):	LOW			Date Recei	.ved: 07/21/89
% Solids:		0				
	Concen	tration Unit	s (ug/L o	r mg∕kg	dry weight)	: UG/L

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			7		<del></del> -	
ICAG No	i I Annivira	Concentration	, ,	Q	M	'
ICAS NO.	i Hilalyte	i Conceller arton	101	GE C	!	÷
7429-90-5	'	'	',-;		NR	- ',
			1 1		INR	
17440-36-0			1 1			1
17440-38-2					NR	i
17440-39-3			1		NR	i
17440-41-7					INR	i
17440-43-9			; ;		INR	1
17440-70-2			; ;		INR	;
17440-47-3	Chromium_	1	1 1	•	NR	;
17440-48-4	Cobalt	•	1 1		INR	ŀ
17440-50-8	Copper	}	; ;		! NR	1
17439-89-6			; ;		INR	;
:7439- <del>9</del> 2-1			; ;		.NR	;
17439-95-4	:Magnesium:		; ;		l NR	;
17439-96-5	:Manganese:	<b> </b>	; ;		l NR	ì
1 <b>7439-</b> 97-6			: U:		:CV	;
17439-02-0			; ;		! NR	1
17440-09-7			: :		! NR	1
17782-49-2	Selenium		: :		! NR	;
17440-22-4			: :		INR	;
17440-23-5			: :		INR	;
17440-28-0			1 1		: NR	!
17440-62-2			; ;		NR	}
17440-66-6	Zinc		; ;		NR.	1
1	Cyanide		! !		NR	;
!		·  -			;	;
·	·		· — ·			•

Color	Before:	Clarity	Before:	Texture:
Color	After:	Clarity	After:	Artifacts:
Commer				

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		INOPGANIC	1 Analysis data s	HEET	r	EPA SAMPLE NO.
		INORGANIC	ANACISIS DATA S	1166		MHP537
Lab Name: KEY	STONE ENVIR	ONMENTAL	Contract: 6	8 -M8	3-0005	
Lab Code: KE	YTX Ca	se No.: 12	334 SAS No.:			SDG No.: MHP520
Matrix (soil/	'water): WAT	ER		Lab	Sample	∍ ID: 890774019
Level (low/me	ed): LOW			Date	e Recei	ived: 07/21/89
% Solids:	0					
	Concentrati	oo Unite ()	ug/L or mg/kg d	rv i	veicht)	): HG/L
	I CAS No	i	:  Concentration		O :	
	!			i_i_		'
	17429-90-5	:Aluminum	) 	1 1		INR
	17440-36-0 17440-38-2	Antimony_			;	
				i i		INR I
	17440-39-3					INR I
	17440-41-7	,		i i		INR I
	17440-43-9			1 1		INR I
	17440-70-2			i i		INR I
	17440-47-3			i i		INR I
	17440-48-4					INR
	17440-50-8		•	i i		INR I
	17439-89-6			i i		INR    NR
	17439 -92 -1		i 1	i i		INR I
	17439-95-4		<b>i</b> 4	: :	!	NR :
	7439-96-5  7439-97-6					CV I
	17439-02-0			1 1		INR I
	17440-09-7			: :		INR I
	17782-49-2			<u> </u>		NR I
	17440-22-4			ii		NR I
	17440-23-5			i		NR I
	17440-28-0					NR !
	17440-62-2			1		NR I
	17440-66-6	Zinc	1	; ;	;	NR :
				1 1	ł	NR I
		1	·	1_1_		·!
Color Before:		Clarity	y Before:		Т	Texture:
Color After:		Clarit	y After:		P	Artifacts:
Comments:						

		0.5.	EFM - CLF		
		INDEGANIC	1 Analysis data (	SHEET	EPA SAMPLE NO.
		114011071111111111111111111111111111111	TIME TO LO DITTI		MHP538
Lab Name: KEY	STONE ENVIR	ONMENTAL	Contract: 6	5 <b>8-W8-</b> 00 <b>0</b> 5	;
			334 SAS No.:		
Matrix (soil/	'water): WAT	ER		Lab Sampl	e ID: 890774020
Level (low/me	ed): LOW			Date Rece	eived: 07/21/89
% Solids:	o				
	Concentrati	on Units O	ug∕L or mg/kg o	dry weight	:): UG/L
				1 /	!!!
	ICAS No.	: Analyte	Concentration	ic: Q	
	1	1			11
	17429-90-5	Aluminum_		-	INR I
	17440-36-0				INR I
	17440-38-2	'Arsenic		1 1	INR I
	17440-39-3	Barium	}		INR :
	17440-41-7	•			INR !
	17440-43-9				INR I
	17440-70-2				INR I
	17440-47-3			<b>! !</b>	
	17440-48-4	:Cobalt		1 1	
	17440-50-8			: :	
	17439-89-6	!Iron	·	1 1	
	17439-92-1				INR :
	17439-95-4				INR I
	17439-96-5		i 		INK I
	17439-97-6				INR I
	1 <b>7439-</b> 02-0 1 <b>744</b> 0-09-7				INR I
	17782-49-2				INR I
	17440-22-4				INR !
	17440-23-5	Sodium	!		INR I
	17440-28-0	Thallium	ı		INR
	17440-62-2			1 :	INR
	17440-66-6			: :	INR
	1	Cyanide		: :	INR
		!		.   _	11
Color Before:		Clarity	/ Before:		Texture:
Color After:		Clarity	After:		Artifacts:
Comments:					

### U.S. EPA - CLP

		0.0.	2		
•		INDOCANIC	1 ANALYSIS DATA	SHEET	EPA SAMPLE NO.
		INDROMNIC	HINGIUIS DAIA	OTTEE!	MHP539
Lab Name:	KEYSTONE E	NVIRONMENTAL	Contract:	68-W8-0005	
Lab Code:	KEYTX	Case No.: 12	334 SAS No.	•	SDG No.: MHP520
Matrix (so	oil/water):	WATER		Lab Sample	ID: 890774021
Level (lov	v/med):	LOW		Date Recei	ved: 07/21/89
% Solids:		o			
	Concent	ration Units (	ug/L or mg/kg	dry weight)	: UG/L

						<del></del>
i ICAG Na	; !	:  Concentration			i ' M	i
CAS No.	' WHETACE	i Concentration	1 0 1	C.	1 11	•
' '7499-90-5	'Aluminum_	'	<u>'</u> -'		NR	-
	:Antimony				INR	į
	,		, ,		:NR	,
	Arsenic		1 1		INR	1
17440-39-3						-
	Beryllium				INR	1
	Cadmium		; ;		INR	i
	Calcium				INR	i
	Chromium_		; ;		INR	•
	:Cobalt		; ;		! NR	;
	Copper		;		NR	i
17439-89-6	!Iron	1	! :		! NR	;
17439-92-1	!Lead	<b>;</b>	1 1		! NR	;
17439-95-4	:Magnesium	1	; ;		! NR	;
17439-96-5	:Manganese	1	: ;		: NR	ļ
17439-97-6	Mercury	0.20	: U:		:CV	1
	Nickel	•	: :		INR	1
17440-09-7	Potassium	•	: :		: NR	;
17782-49-2	Selenium_	1	: :		INR	1
	Silver		: :		INR	1
	Sodium		: :		INR	;
	Thallium		;		INR	;
	:Vanadium_				NR.	1
	Zinc		; ;		INR	i
		! !			NR	
	,	, !			;	į
'	. '	'	' '		·	- '

Color	Before:	Clarity	Before:	Texture:	
Color	After:	Clarity	After:	Artifacts:	
Commer					

### U.S. EPA - CLP

		INORGANIC	1 ANALYSIS DATA	SHEET	EPA SAMPLE NO.
Lab Name	: KEYSTONE E	NVIRONMENTAL	Contract:	6 <b>8-W8-</b> 00 <b>05</b>	
Lab Code	: KEYTX	Case No.: 1	2334 SAS No.	:	SDG No.: MHP520
Matrix	(soil/water):	WATER		Lab Sampl	e ID: 890774022
Level (	low/med):	LOW		Date Rece	ived: 07/21/89
% Solid	s:	•			
	Concent	ration Units	(ug/L or mg/kg	dry weight	): UG/L
			:Concentration		
	7429-9  7440-3  7440-3  7440-4  7440-4  7440-4  7440-4  7440-5  7439-9  7439-9  7439-9  7439-9	0-5   Aluminum 6-0   Antimony 8-2   Arsenic_ 9-3   Barium_ 1-7   Beryllium 3-9   Cadmium_ 0-2   Calcium_ 7-3   Chromium 8-4   Cobalt_ 0-8   Copper_ 9-6   Iron_ 2-1   Lead_ 5-4   Magnesium 6-5   Marcury_ 2-0   Nickel_ 9-7   Potassium 9-2   Selenium	0.20		NR
Color Be	7440-2  7440-2  7440-2  7440-6  7440-6	2-4  Silver 3-5  Sodium 8-0  Thallium 2-2  Vanadium 6-6  Zinc  Cyanide_	-   -   -   -   -		INR :
			•		
Color Aft	ter:	Clari	ty After:	•	Artifacts:
Comments		•			

### REGION VIII SUMMARY OF DATA QUALITY ASSURANCE REVIEW

### ***guideline references are from Contract #787***

Case No.: SAS 4725H TDD No.: F08-8909-08

Site: Richardson Flats

Contractor Laboratory: Silver Valley Labs

Data Reviewer: Annette Sackman Date of Review: 9-15-89

Sample Matrix: 14 Low Soils

Analysis: Metals plus Mercury

Sample Nos.: 4725H01, 4725H02, 4725H03, 4725H04, 4725H05, 4725H06, 4725H07, 4725H08, 4725H09, 4725H10, 4725H11, 4725H12, 4725H13, 4725H14

- ( ) Data are acceptable for use.
- (X) Data are acceptable for use with qualifications noted.
- ( ) Data are preliminary pending verification.
- ( ) Data are unacceptable.

Action required by DPO?

No X Yes The following items require action:

Action required by project officer?

No X Yes

### The following are our findings:

All calibration and blank contract compliances were met except that for the last half of the thallium analysis the ICV, ICB, CCV and CCB was not recorded on forms IIA and III.

The CRDL standards were run only at the beginning of the furnace AA analysis and not at the end. No qualifications have been prescribed for this discrepancy so no flags are assigned.

Spike recoveries were low for antimony (52.9%) and thallium (48.7%) and indicate positive values for these elements are biased low and flagged "J", estimated. Undetected values indicate antimony and thallium may or may not be present due to elevated detection limits; therefore, these values are flagged "UJ", estimated. Selenium spike recoveries were very low (-33.1%) and indicate these values are severely biased low. Positive values confirm the presence of the element but are flagged "J" and estimated low. Undetected values do not indicate the nonexistence of the element and are unusable and flagged "R", rejected.

For the MSA analysis for thallium, no raw data was presented for duplicate injections. One of the correlation coefficients was below 0.995 for samples 4725H02, 4725H06, 4725H09 and 4725H11; therefore, thallium values for these samples are flagged "J", estimated. For sample 4725H03, both correlation coefficients were below 0.995; therefore, the thallium value for this sample is unusable and flagged "R", rejected.

For the MSA analysis for selenium, both correlation coefficients were below 0.995 for samples 4725H01, 4725H04, 4725H05 and 4725H08; therefore, values for these samples are unusable and flagged "R", rejected.

The percent difference was high for the serial dilution for cadmium (14.5%); therefore these values are flagged "J", estimated.

Lead was analyzed by ICAP due to high sample concentrations, therefore the CRDL of  $5\mu g/l$  was not met but is waived under these unusual conditions.

### Inorganic Data Completeness Checklist

- X Inorganic analysis data (Form I)
- X Initial calibration and continuing calibration verification (Form IIA)
- X CRDL standard for AA and ICP (Form IIB)
- X Blanks (Form III)
- X ICP interference Check sample (Form IV)
- X Spike sample recovery (Form VA)
- X Post digestion spike sample recovery (Form VB)
- X Duplicates (Form VI)
- X Laboratory control sample (Form VII)
- X Standard addition results (Form VIII)
- X ICP serial dilutions (Form IX)
- X Holding times (Form X)
- X Instrument detection limits-quarterly (Form XI)
- X ICP interelement correction factors-quarterly (Form II)
- X ICP linear ranges-quarterly (Form XIII)
- X Raw data for interference checks
- X Raw data for calibration standards
- X Raw data for blanks
- X Raw data for CRI and/or CRA
- X Raw data for samples
- X Raw data for duplicates
- X Raw data for spikes
- X Traffic reports

### Contract Compliance

- I. Initial and Continuing Calibration Verification (ICV and CCV) (guidelines pg. E-4, Form IIA)
  - 1. Was instrument calibrated daily and each time it was set up?

    yes X no
  - 2. Were instruments calibrated using 1 blank and several standards?

    yes X no
  - Were calibration verifications within 90-110%?
     yes X no
  - 4. Were continuing calibrations run at 10% frequency?

    yes X no
- 5. Were the raw data correctly transcribed onto Form IIA?

  yes no X

  Comments: For thallium, one-half of the CCV's were not recorded on

  Forms IIA. All other requirements were met.
- II. CRDL Standards for ICP (CRI) and/or AA (CRA) (guidelines pg. E-6, Form IIB)
  - 1. For ICP analysis, were standards (CRI) @ 2x the CRDL or the IDL (whichever was greater) analyzed at the beginning and the end of each sample run, or at a minimum of twice/8 hour shift, whichever was more frequent?

yes X no

- For furnace AA analysis, were standards (CRA) analyzed at the beginning and the end of each sample run, or at a minimum of twice/8 hour shift, whichever was more frequent? yes no X
- 3. Were the CRI and/or CRA standards analyzed after the ICV?
  yes X no
- 4. Were these data reported on Form IIB?

  yes X no
- 5. Were the raw data correctly transcribed onto Form IIB?

  yes X no

  Comments: No CRA was run at the end of the furnace AA analyses.

### III. Blanks (guidelines pg. E-6, Form III)

- Was the initial calibration blank (ICB) analyzed immediately after the initial calibration verification (ICV)?
   yes X no
- 2. Was a continuing calibration blank (CCB) analyzed immediately after each continuing calibration verification (CCV)?

  yes X no
- 3. Was a preparation blank (PB) analyzed at a frequency of at least 1 in 20 samples?
  yes X no NA
- 4. How many elements were detected above the CRDLs? 0 (if 0, go to question 5)
  - 4a. How many elements were detected in the blanks at greater than one-half the amount detected in any sample?
- 5. Were raw data correctly transcribed onto Form III?

  yes

  no X

  Comments: Only one-half of the blanks for thallium were recorded on Form III. All other requirements were met.
- IV. ICP Interference Checks (ICS) (guidelines pg. E-7, Form IV)
  - 1. Was the ICS analyzed twice per 8 hour shift?

    yes X no
  - 2. Were the ICSs analyzed before and after samples? yes X no
  - 3. Was any massive interference detected? yes no X
  - 4. Were the ICSs within  $\pm 20\%$  mean value? yes X no
  - 5. Were raw data correctly transcribed onto Form IV?

    yes X no

Comments: All requirements met.

- V. Spike Sample Analysis (S) (guideline pg. E-8, Form V)
  - 1. Were spikes analyzed at a frequency of 1 in 20 samples?

    yes X no
  - 2. Were spike recoveries correctly calculated?

    yes X no

$$x = \frac{(SSR - SR)}{SA} \times 100$$

SSR = Spiked Sample Result

SR = Sample Result

SA = Spike Added

- 3. Were spike recoveries within the range of 75-125%?

  yes

  no X
  - 3a. For recoveries outside this range, were associated data flagged "N" by the laboratory on Forms I and V? yes X no NA
  - (an exception if granted where the sample concentration is >4X
     the spike concentration)
  - 4. Were raw data correctly transcribed onto Form V?

    yes X no
- * Refer to page E-9 (SOW 787) for information regarding the amount of spike to be added for each analyte and for other information about the Spike Sample Analysis.

Comments: For antimony and thallium, recoveries were 52.9% and 48.7%, respectively; therefore, positive values are flagged "J", estimated and undetected values are flagged "UJ". For selenium, recoveries were -33.1%, therefore, positive values are flagged "J", estimated and confirm the presence of selenium in the sample and undetected values are unusable and flagged "R", rejected.

- VI. Duplicates (D) (guidelines pg. E-11, Form VI)
  - 1. Were duplicates analyzed at a frequency of 1 in 20 samples? yes X no
  - Were RPDs correctly calculated? yes X no

$$RPD = \frac{S - D}{(S + D)/2} \times 100$$

S = Sample
D = Duplicate

- 3a. For sample concentrations >5x the CRDL, were RPDs  $\pm 20$ X? (limits of  $\pm 35$ X apply for soil/sediment/tailings samples) yes X no NA
- 3b. For sample concentrations >5x the CRDL, did duplicate analysis results fall outside the control window of ± the CRDL?

  yes no X NA
- 3c. Where the RPDs exceeded the control limits, were the data flagged '*' on Forms I and VI by the laboratory?

  yes no NA X
  - 4. Were raw data correctly transcribed onto Form VI?

    yes X no
- * Other Considerations:
- Field blanks cannot be used for duplicate analyses
- Duplicates must be analyzed for each analytical method

Comments: All requirements met.

- VII. Laboratory Control Sample (LCS) Analysis (guideline pg. E-12, Form VII)
  - Was an LCS analyzed for every sample delivery group or batch of samples, whichever was more frequent? yes X no
  - Were recoveries within the 80-120% limit? yes X no

-if the recoveries were outside this range the analysis must be terminated, the problem corrected and the previous samples associated with that LCS redigested and reanalyzed.

3. Were the raw data correctly transcribed onto Form VII? yes X no

Comments: All requirements met.

# VIII. Furnace Atomic Absorption (AA) QC Analysis (guidelines pg. E-14, Form VIII)

1. Does the raw data package contain absorbance values for two injections per sample, the average values and the relative standard deviation (RSD)?

yes

no X

 For analyte concentrations > the CRDL, did the RSD for the duplicate injections agree within 20%? (if yes, go to question 3)

yes

no X

 $RSD = \frac{SD}{M} \times 100$ 

SD = Standard Deviation of Duplicate Injections

M = Mean of Duplicate Injections

2a. Were samples that exceeded the 20% criteria reanalyzed?

yes X no

2b. Did any reanalyzed samples exceed the 20% criteria? yes X no

2c. If yes, did the laboratory flag the data of Form I with an 'M'?

yes X

no

Was the recovery of the spike > 40%? (if yes, go to question 4).

yes

no X

If no, was the sample diluted and rerun with another spike?

yes X no

4. Was sample absorbance >50% of spike absorbance?* (if yes, go to question 5).

yes

no X

* Spike absorbance = absorbance of spiked sample - absorbance of sample.

4a. For spike recoveries between 85 and 115%, were results reported to the IDL?

yes X no

 $RPD = \frac{(SSR - SR)}{SA} \times 100$ 

SSR = Spike Sample Recovery

SR = Sample Result

SA = Spike Added

- 4b. For spike recoveries outside the 85 and 115% range, were results reported to the IDL and flagged with 'W'?

  yes X no
- 5. Was spike recovery between 85 and 115%? (if no, go to question 6)
  - 5a. Were results quantified from calibration curve and reported to IDL?

yes

no X

6. Was an MSA at 50, 100 and 150% of the sample absorbance analyzed?

yes X no

- 6a. Was each MSA analysis identified in the raw data along with the slope, intercept and correlation coefficient? yes X no
- 6b. Were these data correctly transcribed onto Form VIII? yes X no
- 6d. If no, were MSAs run once more?

  yes X
- If the correlation coefficients were still > 0.995, data on Form I must be from the run with the best 'r' and the data on Forms I and VII must be flagged with a '+'.

Were these criteria met?

yes X

no

no

6e. Were all MSA obtained data marked with an 'S' or an S+ on form I?

yes X no

Comments: There was no raw data for duplicate injections for the thallium analysis. For the duplicate sample in the selenium analysis, the duplicate injections and the third injection was greater than 20%D. No flag was assigned since this was a QA sample. The thallium values for the following samples had on correlation coefficient <0.995 and are flagged "J", estimated: 4725H02, 4725H06, 4725H09 and 4725H11. The thallium and selenium values for the following samples had both correlation coefficients <0.995 and are flagged "R", rejected: thallium - 4725H03, selenium - 4725H01, 4725H04, 4725H05 and 4725H08.

- IX. ICP Serial Dilution (L) Analysis (guidelines pg. E-12, Form IX)
  - 1. Was an ICP serial dilution performed on each group of samples of a similar matrix (i.e., soil, water) and concentration (i.e., low, high) or for each sample delivery group, whichever was more frequent?

yes X no

2. For elements with concentrations >10X the CRDL, did any exceed the serial dilution results by more than 10%? (if no, skip questions 3 and 4)

yes X no

% difference =  $\frac{I - S}{I}$  X 100

I = Initial Sample Result

- S = Serial Dilution Result (instrument reading X5)
- 3. Which elements had concentrations that exceeded the 10% criteria? Cadmium
- 4. Did the laboratory flag these data with an 'E' on Form IX? yes X no
- 5. Were the raw data correctly transcribed onto Form IX?

  yes X no

Comments: Cadmium values are flagged "J", estimated due to high %D (14.5%).

- X. Instrument Detection Limits (IDL) (guidelines pg. E-13, Form XI)
  - 1. Were IDLs reported for each analyzed element? yes X no
  - Were IDLs reported for each instrument used?
     yes X no
  - Did the IDLs meet the contract requirements? (refer to pg. E-13, SOW 787)

yes

no X

Comments: Lead was analyzed by ICAP due to high sample concentration. No action is taken due to these conditions.

- XI. Interelement Corrections for ICP (guidelines pg. E-13, Form XII)
  - 1. Were correction factors reported on Form XII? yes X no

Comments: All requirements met.

- XII. Linear Range Analysis (LRA) (guidelines pg. E-14, Form XII)
  - 1. Was a linear range verification standard analyzed? yes X no
  - 2. Was the results within  $\pm 5\%$  of the true value? yes no

### Holding Times

Limits: Metals - 6 months; Hg - 30 days; Cn - 28 days.

- 1. Verified date of sample receipt by laboratory 7-24-89
- 2. Date of preparation/analyses 8-10-89
- 3. Were holding times met? yes X no

Analyte	Matrix	Date Sampled	Prep Date	Holding Time		ng Time t/Met	
Mercury Metals	Low soil Low soil		8 <b>-10-89</b> 8 <b>-10-89</b>	23 days 23 days	30 days	Y <b>es</b> Yes	

		INOPCANIC	1. Analysis—data s	HEET	EPA SAMPLE MO:
_					4725H01
Lab Name: S	ILVER VALLEY LABS	[NC.	Contract: 68	-W8-0074	
Lab Code:	SILVER C	ase No.:	SAS No.:	: 4725t	+ soc No.: 47251
_ Matrix (so	il/water): <u>S</u>	DIL		Lab Sampl	
Level (low)	(med): <u>L</u>	$\underline{\mathcal{W}}$		Date Rece	ived: 07/24/89
Solids:	La		٠.		
<b></b>	Concentration	Units (ug/	'L or mg/kg dry	weight):	MG/KG
			1 1	1 1	
	CAS No.	Analyte	Concentration	c a	м
<b>-</b>	7420 00 5		191100	-  -	<del>o</del> l
	17429-90-5	'	18400.	- 7	PITAS
	17440-36-0	Antimony_	·	_  <del>                                     </del>	PITAB
	7440-38-2	Arsenic_	83.2	-::	77
	•	Barium_	<u> </u>	_  =	<del>5,</del> 1
	7440-41-7	•	1.7		PITA8
) Trans	7440-43-9		14.6		7 70
	17440-70-2	• — •	15000.		77.
	•	Chromium_	<u> </u>	z!!-	77
i	· · · · · · · · · · · · · · · · · · ·	Cobalt	11.4		
		Copper	<u> </u>		<del>5</del>
	•	Iron	30800.	-!!7	3
	•	Lead	1790.	-!!#	<del>5</del> -¦
		Magnesium	6130.	-!!7	<del>,                                    </del>
		Manganese	1260.	-}	<del></del> }
	•	Mercury	7.0	-!!5	<u>V  </u>
احييا	•	Nickel	23,5	-!!	
	7440-09-7	Potassium	3160.	- ]	
		Selenium_	3.1		JA RAB
<b></b>	7440-22-4				<del>-</del> -
<del></del>	7440-23-5		<u>239.   B</u>		-1
	7440-28-0		<u> </u>	<del> </del>	HIT/AB
	7440-62-2		2770 I	·!!5	
	•	Zinc	<u> </u>	·  /7	₽.
	¦	Cyanide		.   <u>N</u>	
	<u></u>		l _	.'	_1
Color Before:	: BROWN	Clarity	Before:	_ Te	exture: NENIUA
Color After:	YELLOW	Clarity	After:	_ · A1	tifacts:
Comments:					
	•				•
<del></del>	<del></del>		.,	<del></del>	- ::: <del>- :::</del>
		<del></del>			

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		INORGANICI	1_ Analysis data s	SHEET	EPA SAMPLE NO:
		THOROWITZ-	Mitmine and a		47751107
	-0		Contract: 68	3-W8-0074	4725HO2
Lab Name: SILVE	H VALLEY LABS.	. INC.	<del></del>		
Lab Code: SIL	VER Ca	se No.:	SAS No.	: 4-1251	1 sdc No.: <u>4725</u> Н
Matrix (soil/	water): <u>S</u>	IL		Lab Samp	<del></del>
Level (low/med	d): <u>LO</u>	W		Date Rec	eived: 07/24/89
% Solids:	72	5.0			
	-	<del></del>	A.		44.5 11/5
Co	ncentration	Units (ug/	'L or mg/kg dry	<pre>veight):</pre>	: MG/KG
•	***************************************				
	1				
	CAS No.	Analyte	Concentration	ici û	M
	7429-90-5	Aluminum	8620.		` <del>       </del>
	7440-36-0	•	201.		EATITI
	17440-38-2		590.		DI
	7440-38-2	· ——	147	E	i <del>ን</del> i
	7440-41-7	•		B	i <del>P</del> i
	17440-43-9	•	91.4	*	<b>主工格</b>
•	17440-70-2	• • • • • • • • • • • • • • • • • • • •		- <del></del>	
	7440-70-2  7440-47-3	•	25600	<u>u</u>	$ \frac{P}{P} $
	17440-47-3	•	,	8!	
	•	•	<u> </u>	-;	$\left \frac{\overline{P}}{\overline{P}}\right $
	7440-50-8  7439-89-6		181000		i <u>尹</u> i
	7439-89-8	·	14200	-¦	[ ]
	7439-92-1		9430	-¦	
	7439-95-4 17439-96-5		1730	-1	17
	[7439 <del>-9</del> 6-6		. 4.9		المتحا
	7440-02-0		<u> </u>	-;	
	7440-02-0	· · · · · · · · · · · · · · · · · · ·	1160.	<u>B</u>	2V   P   P
	•	Selenium	46.2	T N	
	•	Silver	47.5	-1	E 08/22/89 JAS
	7440-23-5			B = -1	デi
	7440-28-0	· ·	3.6	BISN	巨丁烟
	•	Vanadium	19.0		<b>デ</b> i
	7440-66-6	Zinc	15500.	_ i	₹1
		Cyanide		_ i	<u>NR</u> i
	; <del></del> }		i	_ii	
<u></u>	'	·			
Color Before: 1	Lavi	Clarit	y Before:		Texture: MEDIU
Color After:	TELLOW	Clarit	y After:		Artifacts:
Comments:					

<b>.</b>			TNORGANIC	1 ANALYSIS DATA	SHEET-		EPA SAMPLE NO.
	Tah Name (	STI VER VOLLEY LOS		Contract:		}   	4725H03
_	ran Hame	SILVER VALLEY LAB	5., INC.				
	Lab Code:	SILVER	ase No.: _	SAS No	.: 47a	BH:	sdg No.: 4725
	Matrix (so	il/water): S	OIL		Lab Sa	-	
	Level (low,	/med): <u>(</u>	<u>w</u>		Date R	ecei.	ved: <u>07/24/</u> 8
-	% Solids:	7	7.9				
-		Concentration	Units (ug,	/L or mg/kg dr	y weight	:): <u>M</u>	16/KG
		CAS No.	Analyte	  Concentration	1   0	I	_
				1		1 "	i
		7429-90-5	Aluminum	7650	-i - i	17	İ
		7440-36-0	· —	/14.			1702
<b>-</b>		7440-38-2	·	ya7		<u> </u>	
		7440-39-3	Barium	130.	IE	学	
		7440-41-7	Beryllium		101	_17	t
		7440-43-9		82.0		10	EXTI
•		7440-70-2	•	2610		1/2	İ
		7440-47-3		1.0	161	10	ĺ
		7440-48-4	Cobalt	38.5		7	İ
ľ		7440-50-8	Copper	459	i	P	
		7439-89-6	Iron	148000		P	
		7439-92-1	Lead	9880	i	اح	
-		7439-95-4	Magnesium	8480	1 _ 1	7	
		17439-96-5	Manganese	1630.		7	
		7439-97-6		6.0		ev 1	
<b>.</b>		7440-02-0		28.8		10	
		7440-09-7	Potassium	1150	BI	101	mas Tas
		17782-49-2	Selenium	42.7		JEI	186 TV
_		17440-22-4	Silver	30.3		<u> </u>	700/89
-		7440-23-5	Sodium	173	اط	171	a 15
		7440-28-0	Thallium	4.1	1+1	E	I MO RMS
		7440-62-2	Vanadium_	21.2	_1	19	
-	•	7440-66-6	Zinc	15100	_1	191	
			Cyanide		_	INRL	•
		راا			_	_	
_	Color Before	: Blown	Clarity	Before:	_	Text	ture: MENT
	Color After:	YELLOW	Clarity	After:		Arti	ifacts:
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## U.S. EPA -- CLP

1. DATA SHEET

EPA SAMPLE NO:

		_
47	25H0	4

	1	NORGANIC: A	NALISIS. DAIR O			1	4725H04
- Vanna STI VEE	. VALLEY 1 ABS	TNIC	Contract: 68	_W8	3-0074	.	
Lab Name: SILVER		· INC.	**- *		17251	1 51	DG No.: <u>4725</u> H
Lab Code: SILV		se No.:	SAS NO.				
Matrix (soil/w	ater): So	<u>I</u> L			b. Samp.		
Level (low/med	): <u>LC</u>	$\omega$		Da	te Rece	eiv(	ed: <u>07/a4/8</u> 9
	<u>5a</u>	2					
<pre>\$ Solids:</pre>	<u></u>	<u></u>				11	CIKE
Cor	ncentration	Units (ug/	L or mg/kg dry		eight):	700	arna.
	CAS No.	   Analyte	  Concentration	C	Q	l M	 
	Í	l		-		7	1
-	7429-90-5	Aluminum_	25100.	<b> -</b>	N	1	JA8
		[Antimony_	200.	¦		E	
	7440-38-2	Arsenic	77/2.	<b>-</b>	E	京子上	į
	7440-39-3	Barium	1.9	B		7	į
	7440-41-7	Berylllum				7	EAT
	7440-43-9	Cadmium	82100	` – i	·	T	
	7440-70-2	Calcium	33.2	-		P	ĺ
	7440-47-3	Curominm"		1		7	
	7440-48-4	Coparr	840.	<u>                                   </u>		7	İ
		Copper	58600.	i – i		7	
	1	Iron	13600	i – i		中中中中中	1
	7439-92-1	Lead		i – i		P	1
	7439-95-4		·	i – i		1	1
	7439-96-5		5.5	i – i		CV	1
	7439-97-6	Mercury	27.0	i – i		P	
	7440-02-0	Nicker	·	i		王	
	7440-09-7	Selenium	15.4		+ N		IM RAS
	7782-49-2  7440-22-4	Silver	86.0	1 🗌		3	1
	17440-23-5	Sodium	447	اعجا			1
		Thallium	23.2	[ <u> </u>	N	罗	I TAB
•	17440-62-2	Vanadium	46.5	<u>                                     </u>		1	
	7440-62-2   7440-66-6	Zinc	15700.	_		1	
	17440-00 0	Cyanide_		_		巫	<u>L</u>
	! <del></del>	]		ا_ا			1
Color Before:	BROWN	Clari	ty Before:			Te	xture: VEDIC
Color After:	YELLOW		ty After:			Art	tifacts:
•	1540V						
Comments:							

		INORGANIC ⁻	1_ ANALYSIS DATA	SHEET	EPA SAMPLEINO.
Lab Name:	SILVER VALLEY LAB	S., INC.	Contract:	68-W8-0074	4725H05
Lab Code:		Case No.: _	SAS No	4725t	sog No.:4725
Matrix (so	il/water): <u>S(</u>	كتد		Lab Samp	le ID:
Level (low	/med): <u>L</u>	<u>w</u>	·	Date Rece	eived: <u>07/24/</u> 8
<pre>% Solids:</pre>	18	<u>}.3</u>			
	Concentration	Units (ug/	/L or mg/kg dr	y weight):	Malka.
	CAS No.	Analyte	  Concentration		м
	17440-36-0		2810		P   T **3
	7440-38-2  7440-39-3	Barium	320	_  <u></u>	P   P
	7440-41-7  7440-43-9  7440-70-2	Cadmium	.47 .149 89700		PIJAB
	7440-47-3  7440-48-4	Chromium    Cobalt	10.9 5,3	<u>B</u>	<del> </del>
	7440-50-8  7439-89-6  7439-92-1	Iron	44800.	_	<u>5</u>
,	7439-95-4  7439-96-5	Magnesium   Manganese	9550 /9900· 3090		
•	7439-97-6  7440-02-0  7440-09-7	Mercury   Nickel   Potassium		<u>B</u>	<u>7</u>   
	7782-49-2    7440-22-4	Selenium   Silver	60.9	_  <u>+ V</u>	1 JAR RAS
	7440-23-5    7440-28-0    7440-62-2		12.7	BI F BI P	   <del>1                                   </del>
•	17440-66-6	Zinc	26480.	P	
Color Before:	BROWN		Before:	_!!	.  xture: Medium
Color After:	YELLOW	Clarity	<del></del>	_	tifacts:
Comments:			- 100		- <del></del>

EPR SAMPLE NO. INORGANIC ANALYSIS DATA SHEET +725H06 Contract: 68-W8-0074 Lab Name: SILVER VALLEY LABS., INC. SAS No.: 4725H SDG No.: 4725HC. Lab Code: SILVER Case No.: Lab Sample ID: Matrix (soil/water): SOIL Date Received:07/24 Level (low/med): % Solids: Concentration Units (ug/L or mg/kg dry weight): MS/K6 Analyte | Concentration | C| M CAS No. 11100. |7429-90-5 |Aluminum N 40.8 |7440-36-0 | Antimony 丁粉 auı |7440-38-2 | Arsenic__ 944 17440-39-3 | Barium P .85 |7440-41-7 |Beryllium PATI. 62.3 [7440-43-9 | Cadmium_ 46900. |7440-70-2 | Calcium ,71 U |7440-47-3 | Chromium_ 64.4 |7440-48-4 | Cobalt 256 17440-50-8 | Copper 4400. 17439-89-6 | Iron 3790 |7439-92-1 | Lead /3300. 17439-95-4 | Magnesium | 201000 |7439-96-5 | Manganese| X.24 17439-97-6 | Mercury P 69.7 17440-02-0 | Nickel 1870 |7440-09-7 | Potassium 5.6 |7782-49-2 |Selenium 13.7 |7440-22-4 |Silver 344. 17440-23-5 | Sodium S N 1.5 |7440-28-0 |Thallium 34.8 |7440-62-2 | Vanadium_ 18800. 7440-66-6 | Zinc Cyanide Clarity Before: ___ RIJUN Color Before: Artifacts: Clarity After: Color After:

7/37

Comments:

### EPA SAMPLE"NO. INORGANIC ANALYSIS DATA SHEET Lab Name: SILVER VALLEY LABS., INC. Contract: 68-W8-0074 Lab Code: SILVER SAS NO.: 4725H SDG NO.: 4725 Case No.: Matrix (soil/water): OTL Lab Sample ID: Level (low/med): Date Received: 07/24/89 % Solids: Concentration Units (ug/L or mg/kg dry weight): MS/KS CAS No. Analyte | Concentration | C| I M I 7429-90-5 | Aluminum 9710 |7440-36-0 | Antimony | BATIS 37.6 17440-38-2 | Arsenic 198 17440-39-3 | Barium 384 |7440-41-7 |Beryllium| Fil |7440-43-9 | Cadmium EATIS 102. 17440-70-2 | Calcium 90700 17440-47-3 | Chromium | 9.9 |7440-48-4 |Cobalt 20.4 17440-50-8 | Copper 264. 17439-89-6 | Iron 64900. |7439-92-1 |Lead 3 250 |7439-95-4 | Magnesium| 20700 |7439-96-5 |Manganese| 19100. P |7439-97-6 |Mercury 182 |7440-02-0 | Nickel 14.0 |7440-09-7 | Potassium 1880 |7782-49-2 |Selenium 9.2 EITAB 17440-22-4 |Silver 23.9 |7440-23-5 | Sodium BI 254 |7440-28-0 |Thallium 自工船 10.1 |7440-62-2 | Vanadium 20.5 17440-66-6 | Zinc 17600. Cyanide color Before: BROWN Clarity Before: ____ Texture: Color After: TELLOW Clarity After: Artifacts: Comments:

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#### 1. TVORGANIC ANALYSIS DATA SHEET

EPA	SAMPLE_NO	-
	OTHER DESIGNATION OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSON OF THE PERSO	•

INORGANIC ANALYSIS DATA SHEET						4725	SH08
Lab Name: SILVE	5 VALLEY 1 AQS	TNC	Contract: 68	-W8-	0074	.	
		. 1110.	SAS No.	. பு	7254	SDG No.	: 472540
Lab Code: SILV		se No.:	SAS NO.		Samp.		
Matrix (soil/W	mater): <u>S</u> 0	工人					פען עיבון
Level (low/med				Dat	te Rece	sived: O	7/24/89
<pre>\$ Solids:</pre>	64.	<u>d.</u>				MAZIUZ	•
Co	ncentration	Units (ug/	L or mg/kg dry	we.	ight):		<b>L</b>
	CAS No.	Analyte	Concentration	  C  	Q	M	
		1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	14000	i		王!	
	7429-90-5	ATUMINUM_		1_12	N	アコル	5
	•	Antimony_  Arsenic	348.	1_1_		P	
	7440-38-2  7440-39-3		286	1_1_	<u>E</u>	P 7 18	
	17440-39-3	Beryllium		121_		1 1 1 1 2	
	7440-41-7   7440-43-9	1 Cadmium	82.3	_ _		TIAN	
	17440-70-2	Calcium	85800	1_1_		12	
	7440-70-2	Chromium	16.5	<b> _ </b> _		P	
	7440-48-4	Cobalt	33.3	<b> _ </b> _		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
	17440-48-4	Copper	567	1_1_		4	
	7440=30=8  7439=89=6	Tron	49200	_ _		4	
	7439-89-8	I Lead	3510	<b> _ </b> _		$\left \frac{p}{A}\right $	
	17439-92-1	Magnesium	·	1_1_		<u>P</u>	
	17439-95-5	Manganese	·	1_1_		7	
	7439-97-6	IMercury	1.1.	1_[_		<u>cv </u>   <u>P </u>  E  T x2  P	
	7440-02-0	INickel	25.8	1_ _			
	17440-09-7	Pctassium	2400	<u> _ </u> _		F - 85	2 RAS
	17782-49-2		13.2	1-14	<u>+N</u>		) /C · / C
	7440-22-4		36.9	!_!_		<del>-</del> -	
	7440-23-5	Sodium	<u> </u>	181			₹ .
•	17440-28-0	Thallium	14.7		SN	E STA	<b>341</b>
•	7440-62-2	Vanadium		171-		T .	
	7440-66-6	Zinc	18300	!-!-		P	
		Cyanide_		!-!-		N	
			[	_ _		!!	4.
Color Before:	BROWN	Clari	ty Before:			Texture:	MENTU
Color After:	YELLOW	Clari	ty After:			Artifact	s:
Compostor							
Comments:							

			1.	CUTTON-	EPA	SAMPLE: NO
			analysis data		47	as H of
Lab Name:	SILVER VALLEY LABS	INC.	Contract: 6	8-W8-007	4   1	ac 11 0 1
Lab Code:	SILVER	ase No.: _	SAS No.	:47a	<u>5</u> H soc	No.:4725
Matrix (so	oil/water): ≤	IL		Lab Sa	ample ID:	
Level (low	/med): <u>LC</u>	$\underline{w}$		Date P	Received:	07/24/
% Solids:	<u> 1a</u>	.6				
	Concentration	Units (ug/	'L or mg/kg drj	y weigh	t): MG/j	te
	1	1	1	11		
	CAS No.	Analyte	Concentration	ici a	M	
	17429-90-5	Aluminum	10900	¦-¦	-   <del> </del>	
	17440-36-0	· · · · · · · · · · · · · · · · · · ·	107	N	ーナー	<i>8</i> 4
	7440-38-2	·	295	<u> </u>	- P	
	7440-39-3	·	229	I_IE	-   P	
		Beryllium	1.4	8	$-\frac{ P }{ P }$	
	7440-43-9	•	90.2	<u> </u>	二注江	NO.
	7440-70-2	• —	38700	¦ — ¦ ———	- F 7	<b>VO</b>
	•	Chromium	/6.3		一; <del>                                     </del>	
	•	Cobalt	20.1	<b>-</b>	7	
		Copper	49,1	-	<u> </u>	
	· · · · · · · · · · · · · · · · · · ·	Iron	68700	-¦	一  <del> </del>	
	·	Lead	6970	-	一; <del>                                    </del>	
		Magnesium	11100.			
	•	Manganese	3070		-  <del> </del>	
		Mercury	5.0			
		Nickel	16.3	-	- <u> ev </u>	
	•	Potassium	1590	-¦	一; <del>声</del> ;	ak X
	:	Selenium	21,9	ISN		The ex
	•	Silver	36.2		- F  -	•
	•	Sodium		<u> </u>	-i7-i	
	•	Thallium	4.1	1 <u>5 N</u>	_i <u>を</u> iす x	<b>P</b>
•	•	Vanadium	31.2		-ipi - "	<b>)</b>
•	7440-66-6	Zinc	15900.	_i	-i7-i	
		Cyanide			TINR	
Color Before	BROWN	Clarity	y Before:		Texture	· MEDI
Color After:	YELLOW		After:		Artifac	ts:
Comments:						
<del></del>						
				· · · · · · · · · · · · · · · · · · ·		

# INORGANIC ANALYSIS DATA SHEET

EPA	.SAMPLE_NO:_

	4725 HIO	<u>.</u>
Н	SDG No.: 4725/	7

Lab Name: SILVER VALLEY LABS., INC.

Lab Code: SILVER Case No.: ____ sas No.: 4725

Contract: 68-W8-0074

Matrix (soil/water): DIL

Lab Sample ID: _

Level (low/med):

Date Received: 07/24/89

\$ Solids:

Concentration Units (ug/L or mg/kg dry weight): MS/KS

CAS No.	Analyte	Concentration	[ <b>C</b> .	Q	М	i
7429-90-5	Aluminum	20200.			至	PACTUL
7440-36-0	Antimony_	10.1	<u>u</u>	17	15	1 2 3/19
7440-38-2	Arsenic _	54 70-	R	<u>S</u>	Ę	6-23-07
7440-39-3	Barium	408	_		12	1
7440-41-7	Beryllium	1.6	_		10	
7440-43-9	Cadmium_	2.2	_			1788
7440-70-2	Calcium	9640	_		2	! !
7440-47-3	Chromium	18.5	_!		7	ļ
7440-48-4	Cobalt	10.9	8		7	
7440-50-8	Copper	40.7	_		7	
7439-89-6	Iron	15500.	_		7	
7439-92-1	Lead	108		<u>-</u>	7	
7439-95-4	Magnesium	6360	_		1	
7439-96-5	Manganese	303	<u> </u>		4	
7439-97-6	Mercury		<u> </u>		CV	
7 <b>440-02-</b> 0	Nickel	17.0	_!		2	
7440-09-7	Potassium	6050	_!	<del></del> !	7	R 33
7782-49-2	Selenium_		u l		5	12 185
7440-22-4	Silver		밁		7	
7440-23-5	Sodium				두	·· ~~
7440-28-0	Thallium_		띡	<u>N</u>	与	W L N
7440-62-2	Vanadium_	37.7	_!		<del></del> '	
7440-66-6	Zinc	302.	_!			
	Cyanide_		_!		AR!	•

Color	Before:

Clarity Before: ____

Color After:

Clarity After: ___

Artifacts:

Comments:

### U.S. EPA .-- CEP

-		INORGANIC	1_ ANALYSIS DA	TA SHEE	<b>T</b>	EPA SAMPLE NO.
Lab Name:	SILVER VALLEY LAB	S. INC.	Contract	: 68-W8-	-0074	4725H11
Lab Code:	STIVER	ase No.:		No.:4		SDG No.: 472540
- Matrix (so	il/water): S	OIL	<del>_</del>		Sample	
Level (low,	/med):	W		•		
% Solids:	Accepted to	<del>ري</del> 7.هـ		Dac	e xecel	ved: 07/a4/89
•	Concentration	Units (ug,	/L or mg/kg	dry wei	ght): /	NG/KG_
	CAS No.	   Analyte	  Concentrati	on C	QIM	
	7429-90-5	Aluminum	2570	!-!	!_	_!
	7440-36-0	Antimony	19500.	- -		-! 00
1	17440-38-2	Arsenic	751.	- - 4	— <del>5</del>	! J 48
	7440-39-3	Barium	late &	- E		• [
	7440-41-7			6	P	.[
ı	. 17440-43-9	Cadmium	185	<del></del>		1
	7440-70-2	Calcium	249000	¦¦		J788
	7440-47-3	Chromium	18.2	¦¦		? {
	7440-48-4	Cobalt	5.9	_ B		, 1
	7440-50-8	Copper	770	-¦		
	7439-89-6	Iron	156000			•
	7439-92-1	Lead	12500		10	
	7439-95-4	Magnesium	29700	<b>-</b> i-i	P	
	7439-96-5	Manganese	19400			
	7439-97-6	Mercury	1.9			
	7440-02-0     7440-09-7		32.1	_ _	<u>CV  </u>	
		Potassium	4790	_ _ _	171	
	7440-22-4	Selenium	19.9	1_1 <u>N</u>	15	7 AS
	17440-23-5	Sodium	60.6	- -	17	
	1 - 4 - 4	Challium	764	181	<u></u>	
	· · · · · · · · · · · · · · · · · · ·	anadium	34.1	<u>                                     </u>	<u> </u>	T 48
	144 4 4 4	inc	38.0	-	$- \frac{\overline{\rho}}{\overline{\rho}} $	
		yanide	24000	·[-]		
		-  -		·{-	- INP	
Color Before:	Beown	Clarity	Before:	.1_1	 Text	ure: MEDIUM
Color After:	YELLOW	Clarity	<u> </u>			facts:
comments:			<del></del>	· <del></del>		** <del>***********************************</del>
		·				
			····			

U.S. EPAL--CLP? EPA SAMPLEINO. INORGANIC ANALYSIS DATA SHEET. Contract: 68-W8-0074 Lab Name: SILVER VALLEY LABS. . INC. SAS No.: 4725H SDG No.: 4725HO Lab Code: SILVER Case No.: Matrix (soil/water): SOIL Lab Sample ID: Date Received: 01/24/89 Level (low/med): \$ Solids: Concentration Units (ug/L or mg/kg dry weight): MG/KG Analyte |Concentration|C| CAS No. M 4880 |7429-90-5 | Aluminum B INS 49,3 |7440-36-0 | Antimony | |7440-38-2 | Arsenic 839 557 17440-39-3 | Barium |7440-41-7 |Beryllium| ۵i 1.6 BATI 131 |7440-43-9 | Cadmium |7440-70-2 | Calcium 167000 니 |7440-47-3 | Chromium 1.0 53.3 |7440-48-4 | Cobalt 17440-50-8 | Copper 156 17439-89-6 [Iron_ 132000 |7439-92-1 | Lead 6900 |7439-95-4 |Magnesium| 23400 |7439-96-5 | Manganese | 23700 |7439-97-6 |Mercury .73 17440-02-0 | Nickel 26.3 |7440-09-7 | Potassium | 1690. 1778 |7782-49-2 |Selenium ڪ مھ |7440-22-4 |Silver <u> ء۔دد</u> BI 17440-23-5 | Sodium 206 SKII. |7440-28-0 |Thallium 21.0 15 N |7440-62-2 | Vanadium 18.6 |7440-66-6 |Zinc 20000. Cyanide Color Before: LLOWN Texture: Clarity Before:

		- •	 
Color After:	JELLOW	Clarity After:	 Artifacts:
Comments:			

<del></del>		INORGANIC	1_ ANALYSIS DATA SE	IEET.	EPA SAMPLE NO:
	SILVER VALLEY LAS	BS., INC.	Contract: 68-		4725H13
		Case No.: _	SAS No.:	47254	SDG No.: 4725/
Matrix (	soil/water): S	OIL	I	ab Sample	
Level (lo	ow/med):	<u>w</u>			
_		3.2		are Kecel	ved: 07/24/89
_			L or mg/kg dry w	/eight): /	WG/KG_
_	CAS No.	Analyte	  Concentration C	QM	
-	7429-90-5  7440-36-0  7440-38-2  7440-39-3	Antimony    Arsenic		N 7	1743
_	7440-41-7  7440-43-9  7440-70-2  7440-47-3	Beryllium   Cadmium_   Calcium	/.Y   b  43.9 14500	€   P   P   P	 
-	7440-48-4  7440-50-8  7439-89-6	Cobalt   Copper   Iron	2416 231 86100		
-	7439-95-4  7439-96-5	Lead  Magnesium  Manganese  Mercury	9430 6340 /560	! <u>\$</u> !	
_	7440-02-0    7440-09-7    7782-49-2	Nickel   Potassium   Selenium	3. 3 22.4 2490 25.1   N		A-D
_	7440-23-5     7440-28-0	Silver Sodium Thallium	15.5   1 21.5   8   1 1.2   8   N		T 128
	7440-66-6 12	Vanadium	90.5 8580	P	7 ")
Color Before	: BROWN	Clarity	Before		11
Color After:		Clarity		Text	ere: <u>MEDIU</u> M facts:
Comments:		-		4464	
					-

#### 1. TNORGANIC ANALYSIS DATA SHEET:

EPA.	SAMPLE NO:

INORGANIC ANALYSIS DATA SAEET 4725H14					
,	Contrac	t: 68-W8-0074			
Lab Name: SILVER VALLEY LABS.	. INC.	1177511	W 1725W		
Lab Code: SILVER Ca	. INC. 47351 SAS	No.: 41001	· SUG NO.: TIOLOFIC		
	ac 14	Lab Sampl			
Macrix (Comme)		· · · · · · · · · · · · · · · · · · ·	ived: 07/24/89		
Level (low/med):	<u>W</u>	Date Rece	Trea. Offer the		
solids:	<u>4</u> 77.4 sc en m		AAC 1116		
Concentration	Units (ug/L or mg/k	g dry weight):	Marka		
CAS No.			м		
l	Aluminum 799		<u>尹</u> i		
7429-90-5	10:		<b>正</b> 1丁格		
7440-36-0  7440-38-2	[ [ [ ] ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [	5   _	$P_{\parallel}$		
7440-38-2  7440-39-3		0.0     E	<u>7</u>		
17440-41-7		63 BI	<u>P</u>		
7440-41-7  7440-43-9	Cadmium   //	3 _	T JAS		
17440-70-2		00	<del>P</del> .		
7440-47-3	Chromium	72 K	P		
7440-48-4	Cobalt	76.8	<del>P</del>		
7440-50-8	Copper	<u>46.</u> _   _	<u>P</u>		
7439-89-6	Iron	000	7		
[7439-92-1		<u></u> ]_!	7		
7439-95-4		80	<u>P</u>		
7439-96-5	Manganese	70			
7439-97-6	Mercury	81!_!	(V) (P) (P)		
7440-02-0	Nickel  3/	<u>.y</u>  _ _	$\frac{r}{\rho}$		
7440-09-7	Potassium 6	7	1748		
7782-49-2	Selenium_ 8	4.0   _   _   _	<u>-</u> 1 ~ ~ 3		
7440-22-4	Silver   39		$\frac{\overline{\varphi}}{\Delta}$		
17440-23-5	Sodium   /05		F 789		
17440-28-0	Thallium_ 6	0       .5	5175		
7440-62-2	Vanadium /0.	<u> </u>			
7440-66-6	Zinc /75	<u>'00</u>  -	NE		
	Cyanide		<u> </u>		
	.		<u> </u>		
color Before: BROWN	Clarity Before	:	Texture: MEDIU		
Color After: YELLOW	Clarity After:		Artifacts:		
Comments:					

# REGION VIII SUMMARY OF DATA QUALITY ASSURANCE REVIEW ***guideline references are from Contract #787***

Case No.: 12334 TDD No.: F08-8909-08

Site: Richardson Flats

Contractor Laboratory: Keystone-Houston

Data Reviewer: Annette Sackman Date of Review: 10-3-89

Sample Matrix: 5 Low Soils, 15 Low Waters

Analysis: Mercury

Sample Nos.: MHL955, MHL956, MHP500, MHP501, MHP502, MHP503, MHP504, MHP506, MHP507, MHP509, MHP510, MHP511, MHP512, MHP513, MHP514, MHP515, MHP516, MHP517, MHP518, MHP519

- (X) Data are acceptable for use.
- ( ) Data are acceptable for use with qualifications noted.
- ( ) Data are preliminary pending verification.
- ( ) Data are unacceptable.

Action required by DPO?

No X Yes The following items require action:

Action required by project officer?

No X Yes

The following are our findings:

All requirements were met for the mercury analysis. No flags were assigned.

recountertingementer

#### Inorganic Data Completeness: Checklist

2.2.

·:..

- X Inorganic analysis data (Form I)
- X Initial calibration and continuing calibration verification (Form IIA)

CRDL standard for AA and ICP (Form IIB)

X Blanks (Form III)

ICP interference Check sample (Form IV)

X Spike sample recovery (Form VA)

Post digestion spike sample recovery (Form VB)

- X Duplicates (Form VI)
- X Laboratory control sample (Form VII)

Standard addition results (Form VIII)

ICP serial dilutions (Form IX)

- X Holding times (Form X)
- X Instrument detection limits-quarterly (Form XI)
- X ICP interelement correction factors-quarterly (Form II)
- X ICP linear ranges-quarterly (Form XIII)

Raw data for interference checks

- X Raw data for calibration standards
- X Raw data for blanks

Raw data for CRI and/or CRA

- X Raw data for samples
- X Raw data for duplicates
- X Raw data for spikes
- X Traffic reports

#### Contract Compliance

- I. Initial and Continuing Calibration Verification (ICV and CCV) (guidelines pg. E-4, Form IIA)
  - 1. Was instrument calibrated daily and each time it was set up?

    yes X no
  - 2. Were instruments calibrated using 1 blank and several standards? yes X no
  - 3. Were calibration verifications within 90-110%? yes X no
  - 4. Were continuing calibrations run at 10% frequency?

    yes X no
- 5. Were the raw data correctly transcribed onto Form IIA?

  yes X no

  Comments: All requirements met.
- II. CRDL Standards for ICP (CRI) and/or AA (CRA) (guidelines pg. E-6, Form IIB)
  - 1. For ICP analysis, were standards (CRI) @ 2x the CRDL or the IDL (whichever was greater) analyzed at the beginning and the end of each sample run, or at a minimum of twice/8 hour shift, whichever was more frequent?

yes no

- 2. For furnace AA analysis, were standards (CRA) analyzed at the beginning and the end of each sample run, or at a minimum of twice/8 hour shift, whichever was more frequent?
  yes
  no
- 3. Were the CRI and/or CRA standards analyzed after the ICV?
  yes no
- 4. Were these data reported on Form IIB?

  yes

  no
- 5. Were the raw data correctly transcribed onto Form IIB?
  yes no
  Comments: Not required.

recycled paper

#### III. Blanks (guidelines pg. E-6, Form III)

- Was the initial calibration blank (ICB) analyzed immediately after the initial calibration verification (ICV)?
   yes X no
- 2. Was a continuing calibration blank (CCB) analyzed immediately after each continuing calibration verification (CCV)?

  yes X no
- 3. Was a preparation blank (PB) analyzed at a frequency of at least 1 in 20 samples?

  yes X no NA
- 4. How many elements were detected above the CRDLs? 0 (if 0, go to question 5)
  - 4a. How many elements were detected in the blanks at greater than one-half the amount detected in any sample?
- 5. Were raw data correctly transcribed onto Form III?

  yes X no

  Comments: All requirements met.
- IV. ICP Interference Checks (ICS) (guidelines pg. E-7, Form IV)
  - 1. Was the ICS analyzed twice per 8 hour shift?

    yes

    no
  - Were the ICSs analyzed before and after samples? yes no
  - 3. Was any massive interference detected?

    yes

    no
  - 4. Were the ICSs within ±20% mean value?

    yes no
- 5. Were raw data correctly transcribed onto Form IV?
  Comments: Not required.

V. Spike Sample Analysis (S) (guideline pg: E-8, Form V)

1. Were spikes analyzed at a frequency of 1 in 20 samples?

yes X no

المعجوب والدر

2. Were spike recoveries correctly calculated?

yes X no

$$\chi_{\text{recovery}} = \frac{(SSR - SR)}{SA} \times 100$$

SSR = Spiked Sample Result

SR = Sample Result
SA = Spike Added

- 3. Were spike recoveries within the range of 75-125%? yes X no
  - 3a. For recoveries outside this range, were associated data flagged "N" by the laboratory on Forms I and V?

    yes no NA X
  - (an exception if granted where the sample concentration is >4X
     the spike concentration)
  - 4. Were raw data correctly transcribed onto Form V?

    yes X no
- * Refer to page E-9 (SOW 787) for information regarding the amount of spike to be added for each analyte and for other information about the Spike Sample Analysis.

Comments: All requirements met.

VI. Duplicates (D) (guidelines pg. E-11, Form VI)

- Were RPDs correctly calculated? yes X no

$$RPD = \frac{S - D}{(S + D)/2} \times 100$$

S = Sample

D = Duplicate

- 3b. For sample concentrations >5x the CRDL, did duplicate analysis results fall outside the control window of ± the CRDL?

  yes no X NA
- 3c. Where the RPDs exceeded the control limits, were the data flagged '*' on Forms I and VI by the laboratory?

  yes no NA
- 4. Were raw data correctly transcribed onto Form VI?

  yes X no
- * Other Considerations:
- Field blanks cannot be used for duplicate analyses
- Duplicates must be analyzed for each analytical method

Comments: All requirements met.

- VII. Laboratory Control Sample (LCS) Analysis (guideline pg. E-12, Form VII)
  - 1. Was an LCS analyzed for every sample delivery group or batch of samples, whichever was more frequent?

    yes X no
  - Were recoveries within the 80-120% limit? yes X no

-if the recoveries were outside this range the analysis must be terminated, the problem corrected and the previous samples associated with that LCS redigested and reanalyzed.

 Were the raw data correctly transcribed onto Form VII? yes X no

Comments: All requirements met.

# VIII. Furnace-Atomic Absorption (AA) QC Analysis (guidelines pg. E-14, Form-VIII)

1. Does the raw data package contain absorbance values for two injections per sample, the average values and the relative standard deviation (RSD)?

yes

no

 For analyte concentrations > the CRDL, did the RSD for the duplicate injections agree within 20%? (if yes, go to question 3)

yes

no

 $RSD = \underbrace{SD}_{M} X 100$ 

SD = Standard Deviation of Duplicate Injections

M = Mean of Duplicate Injections

2a. Were samples that exceeded the 20% criteria reanalyzed?

yes

no

2b. Did any reanalyzed samples exceed the 20% criteria?

yes

no

yes

no

3. Was the recovery of the spike > 40%? (if yes, go to question 4).

yes

no

If no, was the sample diluted and rerun with another spike?

yes

no

4. Was sample absorbance 50% of spike absorbance?* (if yes, go to question 5).

yes

no

* Spike absorbance = absorbance of spiked sample - absorbance of sample.

4a. For spike recoveries between 85 and 115%, were results reported to the IDL?

yes

nο

 $RPD = \frac{(SSR - SR)}{SA} \times 100$ 

SSR = Spike Sample Recovery

SR = Sample Result

SA = Spike Added

- 4b. For spike recoveries outside the 85 and 115% range, were results reported to the IDL and flagged with 'W'?

  yes no
- 5. Was spike recovery between 85 and 115%? (if no, go to question 6)
  - 5a. Were results quantified from calibration curve and reported to IDL?

yes

no

6. Was an MSA at 50, 100 and 150% of the sample absorbance analyzed?

yes

no

- 6a. Was each MSA analysis identified in the raw data along with the slope, intercept and correlation coefficient? yes no
- 6b. Were these data correctly transcribed onto Form VIII?

  yes no
- 6c. Were correlation coefficients(r) > 0.995?

  yes

  no
- 6d. If no, were MSAs run once more?

  yes

  no
- If the correlation coefficients were still > 0.995, data on Form I must be from the run with the best 'r' and the data on Forms I and VII must be flagged with a '+'.

Were these criteria met?

yes

no

6e. Were all MSA obtained data marked with an : 'S' organ S+-onform I?

yes

no

Comments: Not required.

- IX. ICP Serial Dilution (L) Analysis (guidelines pg. E-12, Form IX)
  - 1. Was an ICP serial dilution performed on each group of samples of a similar matrix (i.e., soil, water) and concentration (i.e., low, high) or for each sample delivery group, whichever was more frequent?

yes

no

2. For elements with concentrations >10% the CRDL, did any exceed the serial dilution results by more than 10%? (if no, skip questions 3 and 4)

yes

no

% difference =  $\frac{I - S}{I}$  X 100

I = Initial Sample Result

- S = Serial Dilution Result (instrument reading X5)
- 3. Which elements had concentrations that exceeded the 10% criteria?
- 4. Did the laboratory flag these data with an 'E' on Form IX?

  yes

  no
- 5. Were the raw data correctly transcribed onto Form IX?

  yes

  no

Comments: Not required.

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- X. Instrument Detection Limits (IDL) (guidelines pg. E-13, Form XI)
  - 1. Were IDLs reported for each analyzed element?

    yes X no
  - 2. Vere IDLs reported for each instrument used?

    yes X no
  - 3. Did the IDLs meet the contract requirements? (refer to pg. E-13, SOW 787)

yes X no

Comments: All requirements met.

- XI. Interelement Corrections for ICP (guidelines pg. E-13, Form XII)
  - 1. Were correction factors reported on Form XII?

    yes X no

Comments: All requirements met.

- XII. Linear Range Analysis (LRA) (guidelines pg. E-14, Form XII)
  - Was a linear range verification standard analyzed? yes X no
  - 2. Was the results within  $\pm 5\%$  of the true value? yes no

#### Holding:Times:

Limits: Metals - 6 months; Hg - 30 days; Cn - 28 days.

- 1. Verified date of sample receipt by laboratory 7-21-89
- 2. Date of preparation/analyses 8-3-89
- 3. Were holding times met? yes X no

Analyte	Matrix	Date Sampled	Prep Date	Holding Time	Holding Time Limit/Met	
Mercury Mercury	Low soil Low Water		8-3-89 8-3-89	13 days 13 days	30 days yes 30 days yes	

#### U.S. EPA - CLP

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab-Name: KEYSTONE ENVIRONMENTAL Contract: 68-W8-0005 :

Lab Code: KEYTX

Case No.: 12334 SAS No.:

SDG No.: MHL955

Matrix (soil/water): SOIL

Lab Sample ID: 890773003

Level (low/med): LOW

Date Received: 07/21/89

% Solids:

9**8.**3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

: !CAS No.	: : Analyte	:  Concentration	; ; ;	; ; M	;
1	1	1	;		1
17429-90-5	Aluminum_	`	; -;	 INR	- :
	Antimony_		1 1	INR	1
	Arsenic		1 1	INR	;
	Barium		1 1	INR	;
	Beryllium		!!	! NR	;
17440-43-9	[Cadmium	1 1	; ;	INR	;
17440-70-2	Calcium	<b>}</b> 1	: :	INR	;
17440-47-3	(Chromium_	! !	1 1	INR	;
17440-48-4	Cobalt	!	; ;	: NR	;
17440-50-8	Copper	}	1 1	: NR	ļ
17439-89-6	Iron	;	: :	INR	;
17439-92-1	Lead	!	: :	; NR	,
17439-95-4	Magnesium	1	: :	; NR	;
17439-96-5	Manganese		; ;	INR	!
	Mercury		: :	CV	i
	Nickel		1 1	:NR	;
	Potassium		; ;	INR	:
	Selenium_		: :	INR	1
	Silver		1 1	INR	i
	Sodium		! !	INR	i
	Thallium_			INR	
	[Vanadium_			INR	i
	Zinc		1 1	INR	
	-Cyanide			INR	i
!	. ' !		1_1	 _	. ;

Color	Before:	Clarity	Before:		Texture:	
Color	After:	Clarity	After:		Artifacts:	
Commer	nts:					
						_
				0000		_

#### U.S. EPA - CLP

		0.5.	EFA - ULF		
•		INORGANIC A	1 ANALYSIS DATA S	SHEET	EPA SAMPLE N
ah Namos KE	VOTOME EMUIP	ONMENTAL	Contract: 6	:8-WB-000!	MHL9 <b>56</b> 5
.au Namer Re	STORE ENVIR	CHIENTAL	Commatu		
.ab Code: K	EYTX Ca	se No.: 12:	E34 SAS No.:	;	SDG No.: MHL9
Mahmin (mail	/water): SOI	,		lah Samp	le ID: 89077300
Matrix (SQII	/water/: Sul	<b>L</b>		cau samp.	16 10. 030//300
Level Clow/m	ed): LOW			Date Rece	eived: 07/21/89
% Solids:	97.	Э			
	Concentrati	on Units ()	ug/L or mg/kg o	dry weight	t): MG/KG
	ICAS No.	! Analyte	Concentration	ici a	i m i
	1	!		_   _	- ' '
	17429-90-5			1 1	INR I
	17440-36-0	Antimony_	<b>¦</b>		INR :
	17440-38-2	Arsenic	1		INR I
	17440-39-3	Barium			INR I
	1 <b>744</b> 0-41-7				INR
	17440-43-9			1 1	INR I
	<b>7</b> 440 - 70 - 2				INR :
	17440-47-3				INR I
	17440-48-4	Cobalt		: :	
	17440-50-8	Copper		i i	INR
	17439-89-6			; ;	INR I
	17439-92-1				INR I
	17439-95-4			i 1	INR I
	17439-96-5			1 1	icv i
	1 <b>7439-</b> 97-6 1 <b>7439-</b> 02-0			: :	INR !
	17440-09-7				
	17782-49-2			1 1	
	17440-22-4				INR I
	17440-23-5			i i	INR !
	17440-28-0				INR
	17440-62-2				INR I
	17440-66-6				INR
		Cyanide		: :	INR :
		;		.   _	_
olor Before:		Clarity	/ Before:		Texture:
olor Af <b>ter:</b>		Clarity	/ After:		Artifacts:
Comments:					

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#### U.S. EPA - CLP

		J.U.	2 32.					
		INORGANIC A	1 A <b>NA</b> LYSIS DATA	SHEET	•	EPA	SAMPI MHP50	
Lab Name: KE	YSTONE ENVIR	ONMENTAL	Contract:	6 <b>8-W</b> 8	-0005	; 	11111	
tak Madaa K	/#\/T\/		04.0 N-	_		CDC I		411.05
rap code: k	EYIX Ca	se No.: 123	34 SAS No.	:		י טעכ	VO.: 1	1HE33
Matrix (soil	./water): SOI	L		Lab	Sample	e ID:	83077	73007
tevel (low/m	ned): LOW			Date	Recei	.ved:	07/21	1/83
% Solids:	98.	6						
	CAS No.	   Analyte   	cg/L or mg/kg (		a :	M :	/KG	
	17429-90-5 17440-36-0 17440-39-3 17440-41-7 17440-43-9 17440-47-3 17440-48-4 17440-50-8 17439-95-4	Antimony_ Arsenic_ Barium Beryllium; Cadmium_ Calcium_ Chromium_ Cobalt; Copper; Iron Lead				NR		
	17439-96-5 17439-97-6 17439-02-0 17440-09-7 17782-49-2 17440-22-4 17440-23-5 17440-28-0 17440-66-6	Manganese Mercury Nickel Potassium Selenium_ Silver Sodium Thallium_ Vanadium_ Zinc	. 0.88			NR IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII		
Color Before:		Clarity	Before:		Т	extur	e:	
Color After:		Clarity	After:		Α	rtifa	cts:	
Comments:								

		u.s.	EPA - CLP		
•		INORGANIC	1 ANALYSIS DATA :	SHEET	EPA SAMPLE N
					MHP501
.ab Name: KE	EYSTONE ENVIR	RONMENTAL	Contract:	68-W8-000	5
.ab Code: k	ŒYTX Ca	se No.: 12	324 SAS No.	:	SDG No.: MHL9
Matrix (soi)	l/water): SOI	L		Lab Samp	le ID: 89077300
Level (low/m	ned): LOW	J		Date Rece	eived: 07/21/89
% Solids:	82.	4			
	Concentrati	on Units (	ug/L or mg/kg (	dry weight	o: MG/KG
	!			: ;	
	CAS No.	Analyte	Concentration	:C: Q	: M :
	7429-90-5		! 	-   -	-       NR
	17440-36-0 17440-38-2	Antimony	† 1		
	17440-38-2	:Arsenic	, !		
	17440-39-3	Barium	!	•	INR I
	17440-41-7			1 1	
	17440-43-9			1 1	INR I
	17440-70-2				INR :
	17440-47-3			1 (	IND
	17440-48-4			1 1	INR !
	17440-50-8			1 1	INR !
	: <b>743</b> 9-89-6			: :	INR
	17439-92-1			1 1	INR I
	17439-95-4			}	INR :
	17439-96-5	:Manganese	<u> </u>	1 1	INR :
	:7439-97-6			1 1	ICV I
	17439-02-0				INR :
	1 <b>744</b> 0-09-7				INR :
	<i>77</i> 82-49-2				INR :
	17440-22-4	Silver	1	1 1	INR I
	17440-23-5			1 1	INR I
	17440-28-0			; ;	INR
	17440-62-2	Vanadium_			INR !
	17440-66-6			1 1	INR :
		Cyanide 			INR   
olor Before:		Clarity	Before:		Texture:
olor After:		Clarity	/ After:		Artifacts:
omments:					

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		INORGAN	1 C ANALYSIS DATA	SHEET	EPA SAMPLE NO.
.ab Name:	KEYSTONE	ENVIRONMENTAL	. Contract:	68-W8-0005	
.ab Co <b>de:</b>	KEYTX	Case No.:	12334 SAS No.	.:	SDG No.: MHL955
Matrix (so	oil/water)	: SOIL		Lab Sample	ID: 890773009
tevel (lov	v/med):	LOW		Date Recei	ved: 07/21/89

% Solids: 92.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

:  CAS No.	Analyte	: :Concentration :	C	Q	; ; M	:
7429-90-5	Aluminum_	¹	``-		NR	• }
	Antimony_		1		INR	1
	Arsenic		: :		INR	1
	:Barium		1 1		INR	;
	Beryllium		: :		INR	1
	Cadmium		: :		:NR	;
17440-70-2			1 1		: NR	;
17440-47-3	[Chromium]	<b>;</b>	: :		INR	;
17440-48-4	(Cobalt	<b>!</b>	1 1		INR	;
17440-50-8	Copper	}	; ;		INR	;
17439-89-6	(Iron	<b>!</b>	1 1		INR	;
17439-92-1	:Lead	<b>!</b>	: :		INR	!
17439-95-4	Magnesium	}	: :		INR	!
17439-96-5			: :		INR	:
17439-97-6			: :		ICV	1
17439-02-0			;		INR	1
17440-09-7			1 1		INR	;
17782-49-2			1		NR	1
17440-22-4			1 1		INR	i
17440-23-5			1 1		INR	i
17440-28-0			! !		INR	;
17440-62-2					INR	i
17440-66-6	Zinc				INR	i
	Cyanide				INR	i
			; _ ;		-	, <b>i</b>

Color Before:	Clarity Before:	Texture:
Color After:	Clarity After:	Artifacts:
Comments:		

- Tables

#### U.S. EPA - CLP

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•	1 INORGANIC ANALYSIS DATA	EPA SAMPLE NO. SHEET :
Lab Name: KEYSTONE E	NVIRONMENTAL Contract:	
Lab Code: KEYTX	Case No.: 12334 SAS No.	: SDG No.: MHL955
Matrix (soil/water):	WATER	Lab Sample ID: 890773010
Level (low/med):	LOW	Date Received: 07/21/89
% Solids:	0	

Concentration Units (ug/L or mg/kg dry weight): UG/L

1		'			   ha	-
CAS No.	: Analyte	Concentration	اباز	Q	! M	•
17429-90-5	Aluminum		<u></u>		NR	• ¦
	Antimony_		: :		NR	•
			. ;		NR	į
	Arsenic	•			NR	;
	Barium					,
	Beryllium		i i		NR	
	Cadmium		i i	•	NR	i
	Calcium		i i		NR	i
17440-47-3	Chromium_	l	1 1		NR	í
	Cobalt		; ;		NR	1
17440-50-8	Copper	<b>!</b>	; ;		NR	-
17439-89-6	Iron	!	: :		NR	;
17439-92-1	Lead	•	1 1		NR	
17439-95-4	Magnesium	•	: :		NR	1
17439-96-5	_		: :		NR	;
17439-97-6	Mercury		: U:		CV	;
	Nickel		: :	,	NR	t t
	!Potassium:		: :		NR	;
	:Selenium_		: :		NR	;
	Silver				NR	;
	Sodium		: :		NR	;
	Thallium_				NR	:
	:Vanadium_		: :		NR	:
17440-66-6		! !	: !		NR	:
		<u>.</u>	!!		NR	•
ļ	Cyanide	·	1 1		!	!
'	· '		<b>'</b>		'	٠'

Color	Before:	Clarity	Before:	Texture:
Color	After:	Clarity	After:	Artifacts:
Commen	nts:			

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#### U.S. EPA - CLP

Lab	Name:	KEYSTONE				1 YSIS DATA ontract:	SHEET 68-W8-0005	EPA SAMPLE	
Lab	Code:	KEYTX	Case	No.:	12334	SAS No.	.:	SDG No.: MH	IL955
Mat	rix (sc	oil/water)	: WATER				Lab Sample	ID: 890773	011
Lev	el (low	v/med):	LOW				Date Recei	ved: 07/21/	89
% 8	Solids:		ø						
		Concen	itration	Units	(ug/L	or mg/kg	dry weight)	: UG/L	
								<del></del> :	

: :CAS No.	: : Analyte	: :Concentration	  C	a	; ; M	;
1	1		! !		!	;
17429-90-5	Aluminum_	`	- : -		INR	•
	Antimony_		1 1		INR	1
	Arsenic		; ;		INR	;
	Barium		; ;		INR	:
	Beryllium		1 1		INR	1
	Cadmium		: :		INR	i
	Calcium_		1 1		INR	1
	[Chromium_		1 1		: NR	1
	Cobalt		<b>!</b> !		INR	ť
17440-50-8			1 1		: NR	ļ
17439-89-6	Iron		: :		INR	1
17439-92-1	:Lead	}	; ;		:NR	;
17439-95-4	Magnesium	<b>!</b>	: :		; NR	;
17439-96-5	/Manganese		1 1		INR	1
17439-97-6	Mercury	0.20	; U ;		CV	;
17439-02-0	Nickel		1 1		INR	;
	Potassium		: :		INR	;
	Selenium_		1 1		INR	i .
	Silver		: :		INR	!
	Sodium:		1 1		INR	!
	:Thallium_:				INR	;
	Vanadium_				INR	!
17440-66-6	:Zinc:		1 1		INR	:
	Cyanide:		; ;		INR	;

Color Before:	Clarity Before:	Texture:
Color After:	Clarity After:	Artifacts:
Comments:		

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#### U.S. EPA - CLP

·			1 IC ANALYSIS DA		EPA SAMPLE NO.
Lab Name:	KEYSTONE	ENVIRONMENTA	L Contract:	: 6 <b>8-W8-</b> 00 <b>5</b>	·
Lab Code:	KEYTX	Case No.:	12334 SAS I	No.:	SDG No.: MHL955
Matrix (so	il/water)	: WATER		L <b>ab</b> Sample	D: 890773012
Level (low	/med):	LOW		Date Recei	ived: 07/21/ <b>89</b>
% Solids:		0			
	Concer	itration Unit	s (ug/L or mg/l	kg dry weight)	: UG/L

CAS No.	Analyte	Concentration	c	a	M
7429-90-5	:  Aluminum_		-		NR
7440-36-0	_		1 1		INR
7440-38-2	/ <del>-</del>		1 1		INR
	Barium				INR
7440-41-7					:NR
	Cadmium		1 1		INR
	Calcium		1 1		INR
7440-47-3					INR
7440-48-4	<del>-</del>				INR
7440-50-8					INR
7439-89-6					INR
7439-92-1		' !			INR
7439-95-4		! !	1		INR
7439-96-5			i		INR
7439-97-6	-		U		:CV
7439-02-0			; ;		INR
	Potassium		1 1		: NR
	Selenium_		iii		INR
	Silver				INR
7440-23-5					INR
7440-28-0					INR
	Vanadium_				INR
7440-66-6					INR
,, <b>00</b> 0	Cyanide				INR
	·	•			1

Commer	nts:			
Color	After:	Clarity	After:	Artifacts:
Color	Before:	Clarity	Before:	lexture:

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#### U.S. EPA - CLP

		3.0.	<b></b>		
•		INORGANIC	1 ANALYSIS DATA	SHEET	EPA SAMPLE NO.
Lab Name:	KEYSTONE ENVIR				MHP507
Lab Code:	KEYTX Ca	se No.: 12	334 SAS No.	:	SDG No.: MHL955
Matrix (so	oil/water): WAT	ER		Lab Sample	ID: 890773013
Level (low	v/med): LOW	1		Date Recei	ved: 07/21/89
% Golids:	o			•	
	Concentrati	on Units (	ug/L or mg/kg	dry weight)	: UG/L
	1	!			!
			Concentration		M ! !
	17429-90-5	Aluminum	:	1 1 1	NR :
	17440-36-0	:Antimony_	t 1		NR (
	17440-38-2				NR !
	17440-39-3	Barium	!		NR :
	17440-41-7			i i i	ù <b>κ</b> :
	17440-43-9				NR
	17440-70-2				NR :
	17440-47-3			1 1	NR :
	17440-48-4				NR (
	17440-50-8	Copper	1		NR !
	17439-89-6	Iron		; ;	NR :
	17439-92-1	Lead	! !		NR :
	17439-95-4	:Magnesium			NR :
	17439-96-5	:Manganese:	0.20		
	17433-97-6	Mercury	; Q.20	:U! :	
	17439-02-0			1 1	
	1 <b>744</b> 0-09-7				NR I
	17782-49-2				NR
	17440-22-4	Silver	i !		NR : NR :
	17440-23-5	:50d1um:	i !		NR :
	17440-28-0 17440-62-2				NR :
	17440-66-6				NR :
					NR :
Color Befor	e:	Clarity	/ Before:	T	exture:
Color After	:	Clarity	/ After:	A	rtifacts:
Comments:					

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INDRGANIC ANALYSIS DATA SHEET	•••••						
Lab Name: KEYSTONE ENVIRONMENTAL Contract: 68-WB-0005  Lab Code: KEYTX					1		EPA SAMPLE NO.
Lab Name: KEYSTONE ENVIRONMENTAL Contract: 68-W8-0005:  Lab Code: KEYTX				INORGANIC A	ANALYSIS DATA S	SHEET	: MHP509
Lab Code: KEYTX		lah Name: KEN	STONE ENVIR	ONMENTAL	Contract: 6	58-W8-0005	
Matrix (soil/water): WATER  Level (low/med): LOW  Concentration Units (ug/L or mg/kg dry weight): UG/L    CAS No.   Analyte   Concentration   C   Q   M	ادج ومصدم						
Z Solids: 0    Concentration Units (ug/L or mg/kg dry weight): UG/L	•	Lab Code: KI	EYTX Ca	se No.: 123	34 SAS No.:	:	SDG No.: MHL955
Z Solids: 0    Concentration Units (ug/L or mg/kg dry weight): UG/L	•	M-1 1 211	A. E. S. 114-			1 - b - C 1 -	. ID. 000779014
Concentration Units (ug/L or mg/kg dry weight): UG/L    CAS No.   Analyte   Concentration   C   G   M		Matrix (SOII/	(water): WAI	ER		Lab Sample	10: 350//3014
Concentration Units (ug/L or mg/kg dry weight): UG/L    CAS No.	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	Level (low/me	ed): LOW			Date Recei	.ved: 07/21/89
CAS No.   Analyte   Concentration   C   G   M		% Solids:	0				
CAS No.   Analyte   Concentration   C   G   M							
CAS No.   Analyte   Concentration   C   Q   M			Concentrati	on Units ()	ig/L or mg/kg d	ary weight:	: 06/L
CAS No.   Analyte   Concentration   C   Q   M	• "			<u> </u>		· · · · · · · · · · · · · · · · · · ·	!
7440-43-9   Cadmium	11.00		CAS No.	: : Analyte	Cancentration		m :
7440-43-9   Cadmium			1	1			
7440-43-9   Cadmium	1.000		17429-90-5	Aluminum_		; ;	
7440-43-9   Cadmium			17440-36-0	:Antimony_	}		
7440-43-9   Cadmium			17440-38-2	:Arsenic	<b>!</b>	•	
7440-43-9   Cadmium			17440-39-3	Barium			
7440-70-2   Calcium			7440 -41 -7	Beryllium	}		
7440-47-3   Chromium			17440-43-9	:Cadmium			
7440-48-4   Cobait			17440-70-2	:Calcium:	<b>!</b>		
7440-48-4   Cobait			17440-47-3	Chromium_		1 1	NR
7439-89-6   Iron	·		:/440-48-4	:Cobalt:	•	1 1	NR :
7439-95-4   Magnesium			17440-50-8	:Copper	:		
7439-95-4   Magnesium			17439-89-6	:Iron			
			17439-92-1	:Lead		; ;	NR :
	) - (-taett		17439-95-4	:Magnesium:		· ·	
			17439-96-5	:Manganese:			
7440-09-7   Potassium	•		1 / 4 / 7 7 7 7 7 7 8 8	HIPTCHIV :	U = 25/2/		
7440-09-7   Potassium			17439-02-0	:Nickel:			
7440-22-4   Silver			17440-09-7	:Potassium:			
7440-23-5   Sodium_							
7440-28-0   Thallium							
7440-66-6   Zinc						•	
Cyanide_    NR	• •					•	
				Cyanide			
Color Before: Clarity Before: Texture:	•		!	! !		_	
	u usa sara e a sara e	Color Before:		Clarity	/ Before:	т	exture:

Artifacts: Color After: Clarity After: Comments:

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#### U.S. EPA - CLP

		INORGANI	1 C ANALYSIS DATA	SHEET	EPA SAMPLE NO.
Lab Name:	KEYSTONE B	NVIRONMENTAL	Contract:	68-W8-0005	 
Lab Code:	KEYTX	Case No.:	12234 SAS No.	. :	SDG No.: MHL955
Matrix (so	pil/water):	WATER		Lab Sample	ID: 890773015
Level (low	v/med):	LOW		Date Receiv	ved: 07/21/89

0

% Solids:

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	: : Analyte	  Concentration 	C	a	: : M	:
17429-90-5	Aluminum_	` }	-		NR	•
	Antimony_		: :		NR	
	Arsenic				NR	
	Barium		:		NR	
	Beryllium				NR	;
	Cadmium		: :		NR	
	Calcium				NR	1
	Chromium_		! !		NR	:
	Cobalt				NR	1
	Copper		:		NR	;
	Iron				NR	!
17439-92-1			: :	- 1	NR	1
	Magnesium		:	i	NR	:
	:Manganese		: :	1	NR	;
	Mercury		U:		CV	1
17439-02-0			: :	;	NR	;
17440-09-7			!	:	NR	;
17782 -49-2	:Selenium_:	:	;	;	NR	ļ
17440-22-4	Silver	:	:	ŀ	NR	;
17440-23-5	Sodium	:	1	;	NR	;
17440-28-0	:Thallium_:	:	:	;	NR	ŀ
17440-62-2	[Vanadium]	;	- (	:	NR	į
17440-66-6	Zinc	!	;	;	NR	i
	Cyanide!	;	;	1	NR	;
	!!		_;	!		!

Color	Before:	Clarity Before:	Texture:
Color	After:	Clarity After:	Artifacts:
Commer			

		0.5.	EPA - CLF			
			1 ANALYSIS DATA S		†	EPA SAMPLE NO.
Lab Name: KE	YSTONE ENVIR	RONMENTAL	Contract: 6	58-W8-	-0005	
Lab Code: K	EYTX Ca	se No.: 12	224 S <b>AS</b> No.:	;	9	DG No.: MHL95
Matrix (soil	/water): WAT	ER		Lab S	Sample	ID: 890773016
Level (low/m	ed): LOW	1		Date	Receiv	ed: 07/21/89
% Solids:	0					
	Concentrati	on Units (	ug/L or mg/kg o	dry we	eight):	UG/L
	CAS No.		  Concentration		Q	м
	7429-90-5	Aluminum	 !	-	: -	' IR ;
	17440-36-0				IN	
	17440-38-2				IN	
	17440-39-3				IN	
	17440-41-7				IN	
	17440-43-9			: i	i N	R :
	17440-70-2				l N	
	17440-47-3					R
	17440-48-4				IN	
	7440-50-8					R
	. 17439-89-6					R i
	17439-92-1					R
	7439-95-4					R
	17439-96-5				i N	
	17439-97-6			1111	: 0	
	17439-02-0		!	1 1		R I
	17440-09-7					R I
	7782-49-2					R I
	17440-22-4					R :
	17440-23-5	:Sodium	, !		i N	
	17440-28-0					R :
	17440-62-2					R ¦
	17440-66-6	:/anaulum_:	! !	1 1		R ¦
		Cyanide:				R i
		1	!			;
Color Before:		Clarity	/ Before:		Te	 xture:
Color After:		Clarity	/ After:		Ar	tıfacts:

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Comments:

#### U.S. EPA - CLP

		INORGANIC	ANALYSIS DATA S	SHEE	T	;	 MHP5
Lab Name: KI	EYSTONE ENVIR	ONMENTAL	Contract: 6	5 <b>8-</b> W	B-000		
Lab Code: i	ŒYTX Ca	se No.: 12	334 SAS No.:	;		SDG N	o.: i
Matrix (soi)	/water): WAT	ER		Lab	Samp	le ID:	8 <b>307</b> 1
Level (low/m	ned): LOW	1		Dat	e Rec	eived: (	07/2:
% Solids:	Ó						
	Concentrati	on Units (	ug/L or mg/kg o	iry	weigh	t): UG/	L
	. ! !	1		1 :		1 1	
	CAS No.	Analyte	Concentration	10:	a	! M !	
				-!-!		-!!	
	17429-90-5	Aluminum_				INR I	
	17440-36-0	Antimony_	•	i i		INR I	
	17440-38-2			. 1		INR :	
	17440-39-3			i i		INR :	
	17440-41-7			i i		INR :	
	17440-43-9			1 1		INR :	
	17440-70-2			1 1		INR I	
	17440-47-3			1 1		INR I	
	17440-48-4	Cooalt		1 1		INR I	
	17440-50-8	Lopper	) •	1 1		INR I	
	17439-89-6	:1ron:		1 1		INR :	
	17439-92-1			1 1		INR I	
	7439-95-4   7439-96-5			!!		INR	
	17439-97-6			: 0 :		ICV :	
	17439-02-0					NR I	
	17440-09-7			1 1		INR :	
	17782-49-2			: :		INR :	
	17440-22-4			: :		INR :	
	17440-23-5	Sodium !				INR :	
	17440-28-0	:Thallium :		1		INR I	
	17440-62-2					INR I	
	17440-66-6	Zinc !				INR I	
		Cyanide		: :		INR :	
				-1-		11	
Calor Before:		Clarity	Before:			Texture	:
Color After:		Clarity	After:			Artifac	ts:
Comments:							

	u.s.	EPA - CLP	
	INORGANIC	1 A <b>na</b> lysis data sheet	EPA SAMPLE NO.
Lab Name:	KEYSTONE ENVIRONMENTAL	Contract: 68-W8-0	MHP513 
Lab Code:	KEYTX Case No.: 12	224 SAS No.:	SDG No.: MHL955
Matrix (so	il/water): WATER	L <b>ab</b> Sa	ample ID: 890773020
Level (low	/med): LOW	Date f	Received: 07/21/89
% Solids:	o		
	Concentration Units (	ug/L or mg/kg dry wei	ight): UG/L
	CAS No.   Analyte		
	7429-90-5   Aluminum_   7440-36-0   Antimony_   7440-38-2   Arsenic_   7440-39-3   Barium_   7440-41-7   Beryllium		NR
			NR
	17439-92-1   Lead		INR I

17439-95-4 (Magnesium) :NR : 17439-96-5 (Manganese) 1 1 INR : 17439-97-6 |Mercury__! 0.20 (U) ICV : 17439-02-0 | Nickel___| INR : 17440-09-7 (Potassium) INR : | 17782-49-2 | | Selenium_| INR I 17440-22-4 (Silver___) INR 17440-23-5 |Sodium___: INR : 17440-28-0 (Thallium_) INR : || 17440-62-2 || || Vanadium_| 1 1 INR :

Color	Pefore:	Clarity	Before:	Texture:
Color	After:	Clarity	After:	Artifacts:
Commer	nts:			

17440-66-6 | Zinc____|

ASSECT.

INR :

#### U.S. EPA - CLP

		U.S.	. EPA - CLP		
•		INORGANIC	1 ANALYSIS DATA	SHEET	EPA SAMPLE NO
Lab Name:	KEYSTONE ENVI		Contract:		•
			234 S <b>as</b> No.		
	il/water): WAT				
				Lab Sample	ID: 890773021
revet (low	/med): LOW	J		Date Recei	ved: 07/21/89
% Solids:	Q.				
	Concentrati	on Units (	ug/L or mg/kg	dry weight)	: UG/L
	ı	1			<del></del>
	CAS No.	Analyte	Concentration	ici a	M :
	7429-90-5	Aluminum	[	-,-,- <b></b> .	<del></del>
	17440-36-0	[Antimony	1 ‡		VR :
	17440-38-2	lArsenic	!		NR
	:7440-39-3	Barium	1		NR :
	17440-41-7	Bervllium	!		VR :
	1/440-43-9	:Cadmium	Ì		IR
	17440-70-2	Calcium :			IR :
	17440-47-3	Chromium :			IR :
	:7440-48-4	:Cobalt :			IR :
	:/440-50-8	Copper :			IR :
	17439-89-6	Iron:			R I
	17439-92-1	Lead:			R ¦
	17439-95-4 (	Magnesiumi		! ! IN	R !
	17439-96-5   17439-97-5	Manganese:			R :
	7439-97-6     7439-02-0	Mercury:	0.20	:0: :0	V :
	7440-09-7	NICKET :			R :
	7782-49-2	Selenium:			R
	7440-22-4	Silver '			R
	17440-23-5	Sodium		i i ini	
	7440-28-0	Thallium		i i iNi	
	- 17440-62-2 t	Vanadium t		i i iNi	
	7440-66-6	Z'inc		I INF	
	·	Cyanide :	ı		
			; ; ;	; ; NF	
olor Before:		Clarity	· <del>-</del>		ture:
olor After:		Clarity	After:	Art	ifacts:
omments:					

#### U.S. EPA - CLP

•	1	EPA SAMPLE NO.
Lab Name: KEYSTONE E	INORGANIC ANALYSIS DATA S  NVIRONMENTAL Contract: 6	: MHP515 : MHP515
cao Name: RETSTONE E	MATURIALEM COLLEGE:	,G
Lab Code: KEYTX	Case No.: 12334 SAS No.:	SDG No.: MHL955
Matrix (soil/water):	WATER	Lab Sample ID: 890773022
Level (low/med):	LOW	Date Received: 07/21/89
% Solids:	•	

Concentration Units (ug/L or mg/kg dry weight): UG/L

1	!	!	! !	!	:	1
CAS No.	Analyte	Concentration	c	Q	! M !	:
7429-90-5	Aluminum	' !	-		NR	į
17440-36-0	_		: :	}	! NR	;
17440-38-2			: :	}	I NR	i
:7440-39-3			: :	}	INR	;
17440-41-7			: :		: NR	;
17440-43-9			: :		INR	;
17440-70-2			: :		INR	;
17440-47-3			1 1		: NR	1
17440-48-4	Cobalt	1	1 3		! NR	;
17440-50-8	Copper	; 1	1 1		: NR	1
17439-89-6			1 1		NR	1
17439-92-1	Lead	‡ 1	: :		!NR	;
17439-95-4	Magnesium	<b>;</b>	; ;		! NR	;
17439-96-5	!Manganese	<u> </u>	; ;	!	: NR	;
17439-97-6	Mercury	0.20	: U :		:CV	!
17439-02-0	Nickel	1	; ;		NR	1
17440-09-7	lPotassium	1	: :		: NR	:
17782-49-2	Selenium_	1	; ;		NR	;
17440-22-4	Silver	! !	: :		NR	ł
17440-23-5	Sodium	t I	: ;		NR	!
1 <b>7</b> 440-28-0	:Thallium_	! !	: ;		NR	1
17440-62-2	[Vanadium_	<b>{</b>	: :		INR	;
17440-66-6	Zinc	<b>!</b>	: :		NR	1
) 	Cyanide	! !	: :		NR	ŀ
!	\	;	1_1		¦	:

Color	Before:	Clarity B	Before:	Texture:
Color	After:	Clarity A	After:	Artifacts:
Commer	nts:			

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#### U.S. EPA - CLP

INDRGANIC ANALYSIS DATA SHEET

Lab-Name: KEYSTONE ENVIRONMENTAL Contract: 68-W8-0005

Lab Code: KEYTX Case No.: 12334 SAS No.: SDG No.: MHL955

Matrix (soil/water): WATER Lab Sample ID: 890773023

Level (low/med): LOW Date Received: 07/21/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

: :CAS No.	: : Analyte	:  Concentration	101	Q	: : M	;
!		'	:_:		!	_ ;
17429-90-5	:Aluminum_	1	1 1		INR	;
17440-36-0			; ;	i	INR	;
17440-38-2			: :		INR	;
17440-39-3	Barium	) !	: :		INR	1
17440-41-7	Beryllium	•	; ;		INR	1
17440-43-9			: :		INR	;
17440-70-2			: :		INR	:
17440-47-3			: :		!NR	;
17440-48-4			: :		INR	;
17440-50-8			: :		INR	;
17439-89-6			; ;		INR	;
17439-92-1			: :		NR	:
17439-95-4			: :		! NR	:
17439-96-5	-		: :		:NR	;
17439-97-6			: :		CV	;
17439-02-0			; ;		! NR	;
17440-09-7			: :		INR	!
17782-49-2			1		NR	;
17440-22-4	_	!	1		NR	;
17440-23-5	Sodium	:	: :		NR	;
17440-28-0			! !		NR	;
17440-62-2					NR	į.
17440-66-6	Zinc		:		NR	:
1	Cyanide	;			NR	;
	1	_ :			; 	!
			_			

Color i	Before:	Clarity Before:	Texture:
Color /	After:	Clarity After:	Artifacts:
Commen	ts:		

### Keystone DC# 12334-8-5

	U.S. EPA - CLP	
•	1 INORGANIC ANALYSIS DAT	: MHP517
Lab Name: KEYSTONE ENVI	RONMENTAL Contract:	68-M8-0002
Lab Code: KEYTX C	ase No.: 12334 SAS N	SDG No.: MHL955
Matrix (soil/water): WA	TER	Lab Sample ID: 890773024
Level (low/med): LOW	W	Date Received: 07/21/89
% Solids: / O		
	ion Units (ug/L or mg/k	
7440 - 36 - 0	Aluminum	NR
Color Before:	Clarity Before:	'-''' Texture:
Color After:	Clarity After:	Artifacts:
Comments:		

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### Keystone DC# 12334-8-5

### U.S. EPA - CLP

Lab Code: K Matrix (soil Level (low/m % Solids:	(EYTX Call/water): WATed): LOW  Concentrati  CAS No.  17429-90-5 17440-38-2 17440-39-3 17440-41-7 17440-43-9	CONMENTAL  ISE No.: 12  ER  On Units ()  Analyte  Analyte  Antimony  Arsenic  Barium  Beryllium	ug/L or mg/kg o    Concentration     	Lat Dat	Samp e Red weigh	SDG No ole ID: S ceived: C
Lab Code: K Matrix (soil Level (low/m % Solids:	(EYTX Call/water): WATed): LOW  Concentrati  CAS No.  17429-90-5 17440-38-2 17440-39-3 17440-41-7 17440-43-9	ER On Units ( Analyte Analyte Antimony Arsenic Barium Beryllium	ug/L or mg/kg o	Lat Dat	Samp e Red weigh	SDG Note ID: Steel
Matrix (soil Level (low/m % Solids:	Concentrati : CAS No. : 7429-90-5 : 7440-36-0 : 7440-39-3 : 7440-41-7 : 7440-43-9	ER  I Analyte   Aluminum_   Antimony_   Arsenic   Barium   Beryllium	ug/L or mg/kg o    Concentration     	Lat Dat	Samp e Red weigh	ole ID: Seived: C
Level (low/m % Solids:	Concentrati   CAS No.   17429-90-5   17440-36-0   17440-39-3   17440-43-9   17440-43-9	: Analyte : Analyte : Aluminum_ : Antimony_ : Arsenic : Barium : Beryllium	ug/L or mg/kg o    Concentration     	Dat	e Red	eived: 0
% Solids:	Concentrati   CAS No.	on Units () : Analyte : Aluminum_ : Antimony_ : Arsenic : Barium : Beryllium	ug/L or mg/kg o	try	weigh	t): UG/L : M : : NR : : NR : : NR :
	Concentrati   CAS No. 	: Analyte : Analyte : Aluminum_ : Antimony_ : Arsenic : Barium : Beryllium	  Concentration   	1 1		M
	CAS No. ; ;7429-90-5 ;7440-36-0 ;7440-38-2 ;7440-41-7 ;7440-43-9	: Analyte : Analyte : Aluminum_ : Antimony_ : Arsenic : Barium : Beryllium	  Concentration   	1 1		M
	:	Aluminum_   Antimony_   Arsenic_   Barium_   Beryllium				NR : NR : NR :
	:	Aluminum_   Antimony_   Arsenic_   Barium_   Beryllium				NR : NR : NR :
	17440-36-0 17440-38-2 17440-39-3 17440-41-7 17440-43-9	Antimony_  Arsenic  Barium  Beryllium	! ! !	. ' - '		INR   INR
	17440-36-0 17440-38-2 17440-39-3 17440-41-7 17440-43-9	Antimony_  Arsenic  Barium  Beryllium	! ! !	: :		INR   INR
	17440-38-2 17440-39-3 17440-41-7 17440-43-9	Arsenic  Barium  Beryllium	! !	; ;		INR I
	17440-39-3 17440-41-7 17440-43-9	Barium  Beryllium	!			
	1 <b>744</b> 0-41-7 1 <b>744</b> 0-43-9	Beryllium	1			
	17440-43-9			1 1		INR I
				1		INR I
	:7440-70-2	Calcium	:	: :		:NR :
	7440-47-3	Chromium	1	; ;		INR :
	17440-48-4	Cobalt	1	: :		INR :
	:7440-50-8	:Copper	1	1 1		INR !
	:7439-89-6	Iron	1	! !		INR
	17439-92-1			1 1		!NR :
	17439-95-4			; ;		INR :
	17439-96-5			: :		:NR :
	1 <b>7439-</b> 97-6			: 111		:CV :
	17439-02-0			: :		INR
	17440-09-7			1 1		INR
	17782-49-2			; ;		INR !
	17440-22-4			1 1		INR :
	17440-23-5			1 1		INR I
	17440-28-0	Thallium_	1			INR I
	17440-62-2	:Vanadium_:	:	: :		INR I
	17440-66-6	:Zinc	i '	; ;		INR I
		Cyanide	: !	.i _ i		NR   
Color B <b>efore:</b>			y Before:			Texture
Color After:		Clarity	y After:			Artifac
Comments:						

### Keystone DC# 12334-8-5

- ABH MAR

		u.s.	EPA - CLP		
Lab Name: KFV			1 ANALYSIS DATA : Contract: (		EPA SAMPLE NO.
cas name: NE	CIONE ENVIN	DIVIDE	Contract.		'
Lab Code: KE	YTX Ca	se No.: 123	SAS No.	:	SDG No.: MHL955
Matrix (soil/	'water): WAT	ER		Lab Sample	ID: 890773026
Level (low/me	ed): LOW			Date Recei	ved: 07/21/89
% Solids:	. 0				
	[		ig/L or mg/kg o	1 1 1	;
		Aluminum_ Antimony_ Arsenic Barium Beryllium Cadmium_ Calcium_ Chromium_ Cobalt_ Copper Iron Hagnesium Manganese Mercury_ Nickel Potassium Selenium_ Sodium_ Thallium_	0.20		
	17440-62-2 17440-66-6 1	Zinc			NR
Color Before:		Clarity	Before:	Т	exture:
Color After:		Clarity	After:	А	rtifacts:
Comments:					

000028

# REGION VIII SUMMARY OF DATA QUALITY ASSURANCE REVIEW ***guideline references are from Contract #787***

Case No.: 12334 TDD No.: F08-8909-08

Site: Richardson Flats

Contractor Laboratory: Silver Valley Labs

Data Reviewer: Annette Sackman Date of Review: 10-3-89

Sample Matrix: 5 Low Soils, 15 Low Waters

Analysis: Metals plus Mercury

Sample Nos.: MHL955, MHL956, MHP500, MHP501, MHP502, MHP503, MHP504, MHP506, MHP507, MHP509, MHP510, MHP511, MHP512, MHP513, MHP514, MHP515, MHP516, MHP517, MHP518, MHP519

- ( ) Data are acceptable for use.
- (X) Data are acceptable for use with qualifications noted.
- ( ) Data are preliminary pending verification.
- ( ) Data are unacceptable.

Action required by DPO?

No X Yes The following items require action:

Action required by project officer?

No X Yes

The following are our findings:

These samples were originally sent to Keystone-Houston Labs for metal analysis; however, due to contractual problems, Keystone Houston only analyzed for mercury and then sent the samples to Silver Valley Labs for complete metal analysis. This package is the results for the analysis performed by Silver Valley Labs and includes metals plus mercury analysis. Since the samples were first sent to Keystone-Houston Labs, the holding times for the mercury analysis performed by Sliver Valley Labs was missed by seven days. Therefore, all mercury values in this package are flagged "J" and considered estimate.

The remaining data is acceptable for use with the following qualifications:

No final CRDL standard was run for the furnace AA analysis. The CRDL value for selenium was transposed on Form IIB and the correct %D is 78.6%; however, no qualifications are required for these discrepancies.

The spike recovery was below 40% for selenium values for water matrix (22.8%); therefore, all associated selenium values are unusable and rejected "R". The thallium spike recovery for soil matrix was low (54.3%); therefore all thallium soil values are flagged "J" and considered biased low.

Duplicate results for lead water values obtained by ICAP were high (37.0%RPD). Since sample MHP516 was the only water sample in which lead was analyzed by ICAP, this lead value is considered estimated and flagged "J".

All MSA criteria were followed except for the following: MSA was required for arsenic for sample MHP517 and thallium for sample MHP516; therefore these values are estimated and flagged "J". One correlation coefficient was <0.995 for the arsenic analysis for sample MHP518; therefore, this value is flagged "J", estimated. Both correlation coefficients were <0.995 for the arsenic analysis for sample MHP504; therefore this value is unusable and flagged "R", rejected.

Serial dilution results for arsenic and zinc soil values were slightly high, 12.1% and 13.3%, respectively. These soil values are therefore flagged "J", estimated.

The arsenic value for sample MHP516 was analyzed by furnace AA and reported as 46.5  $\mu$ g/l; however, this number was not multiplied by the dilution factor of 50. The correct arsenic value is actually 2326  $\mu$ g/l for this sample.

#### Inorganic Data Completeness Checklist

- X Inorganic analysis data (Form I)
- X Initial calibration and continuing calibration verification (Form IIA)
- X CRDL standard for AA and ICP (Form IIB)
- X Blanks (Form III)
- X ICP interference Check sample (Form IV)
- X Spike sample recovery (Form VA)
- X Post digestion spike sample recovery (Form VB)
- X Duplicates (Form VI)
- X Laboratory control sample (Form VII)
- X Standard addition results (Form VIII)
- X ICP serial dilutions (Form IX)
- X Holding times (Form X)
- X Instrument detection limits-quarterly (Form XI)
- X ICP interelement correction factors-quarterly (Form II)
- X ICP linear ranges-quarterly (Form XIII)
- X Raw data for interference checks
- X Raw data for calibration standards
- X Raw data for blanks
- X Raw data for CRI and/or CRA
- X Raw data for samples
- X Raw data for duplicates
- X Raw data for spikes
- X Traffic reports

#### Contract Compliance

- I. Initial and Continuing Calibration Verification (ICV and CCV) (guidelines pg. E-4, Form IIA)
  - 1. Was instrument calibrated daily and each time it was set up?

    yes X no
  - 2. Were instruments calibrated using 1 blank and several standards?
    yes X no
  - 3. Were calibration verifications within 90-110%? yes X no
  - 4. Were continuing calibrations run at 10% frequency?

    yes X no
- 5. Were the raw data correctly transcribed onto Form IIA?
  yes X no
  Comments: All requirements met.
- II. CRDL Standards for ICP (CRI) and/or AA (CRA) (guidelines pg. E-6, Form IIB)
  - 1. For ICP analysis, were standards (CRI) @ 2x the CRDL or the IDL (whichever was greater) analyzed at the beginning and the end of each sample run, or at a minimum of twice/8 hour shift, whichever was more frequent?

yes X no

- For furnace AA analysis, were standards (CRA) analyzed at the beginning and the end of each sample run, or at a minimum of twice/8 hour shift, whichever was more frequent? yes no X
- 3. Were the CRI and/or CRA standards analyzed after the ICV?
  yes X no
- 4. Were these data reported on Form IIB?

  yes X

  no
- 5. Were the raw data correctly transcribed onto Form IIB?

  yes

  no X

  Comments: The CRA was run only at the beginning of the sample runs and not at the end. The selenium CRDL value was transposed on Form IIB and the correct %D is 78.6%. No flags are required for these discrepancies.

#### III. Blanks (guidelines pg. E-6, Form III)

- 1. Was the initial calibration blank (ICB) analyzed immediately after the initial calibration verification (ICV)?

  yes X no
- 2. Was a continuing calibration blank (CCB) analyzed immediately after each continuing calibration verification (CCV)?

  yes X no
- 3. Was a preparation blank (PB) analyzed at a frequency of at least 1 in 20 samples?

  yes X no NA
- 4. How many elements were detected above the CRDLs? 0 (if 0, go to question 5)
  - 4a. How many elements were detected in the blanks at greater than one-half the amount detected in any sample?
- 5. Were raw data correctly transcribed onto Form III?

  yes X no

  Comments: All requirements met.
- IV. ICP Interference Checks (ICS) (guidelines pg. E-7, Form IV)
  - 1. Was the ICS analyzed twice per 8 hour shift?

    yes X

    no
  - Were the ICSs analyzed before and after samples? yes X no
  - 3. Was any massive interference detected?

    ves no X
  - 4. Were the ICSs within ±20% mean value?

    yes X

    no
- 5. Were raw data correctly transcribed onto Form IV?
  Comments: All requirements met.

- V. Spike Sample Analysis (S) (guideline pg. E-8, Form V)
  - 1. Were spikes analyzed at a frequency of 1 in 20 samples?

    yes X no
  - 2. Were spike recoveries correctly calculated?

    yes X no

$$x recovery = \frac{(SSR - SR)}{SA} \times 100$$

SSR = Spiked Sample Result

SR = Sample Result
SA = Spike Added

- 3. Were spike recoveries within the range of 75-125%?

  yes

  no X
  - 3a. For recoveries outside this range, were associated data flagged "N" by the laboratory on Forms I and V?

    yes X no NA
  - (an exception if granted where the sample concentration is >4X the spike concentration)
  - 4. Were raw data correctly transcribed onto Form V? yes X no
- * Refer to page E-9 (SOW 787) for information regarding the amount of spike to be added for each analyte and for other information about the Spike Sample Analysis.

Comments: Selenium water values are unusable and flagged "R" due to spike recoveries below 40% (22.8%). Thallium soil values are estimated and flagged "J" due to low spike recoveries (54.3%).

- VI. Duplicates (D) (guidelines pg. E-11, Form VI)
  - 1. Were duplicates analyzed at a frequency of 1 in 20 samples? yes X no
  - 2. Were RPDs correctly calculated?

    yes X

    no

$$RPD = \frac{S - D}{(S + D)/2} \times 100$$

S = Sample

D = Duplicate

- 3a. For sample concentrations >5x the CRDL, were RPDs  $\pm 20$ X? (limits of  $\pm 35$ X apply for soil/sediment/tailings samples) yes no X NA
- 3b. For sample concentrations >5x the CRDL, did duplicate analysis results fall outside the control window of ± the CRDL?

  yes no X NA
- 3c. Where the RPDs exceeded the control limits, were the data flagged '*' on Forms I and VI by the laboratory?

  yes X no NA
- 4. Were raw data correctly transcribed onto Form VI? yes no X
- * Other Considerations:
- Field blanks cannot be used for duplicate analyses
- Duplicates must be analyzed for each analytical method

Comments: The selenium values for water sample MHP503D was done on ICAP and was compared to the furnace AA value for MHP503 which gave an RPD of 200%. The ICAP value for MHP503 of 28.02 µg/l, which should have been used for comparison, gives a new RPD of 27.8%. Since no water samples were analyzed by ICAP no flags are assigned to selenium values. Duplicate results for arsenic and lead water samples were high when analyzed by ICAP (200% and 37.0%, respectively). No arsenic values were acquired by ICAP analysis but the lead value for sample MHP516 was analyzed by ICAP and is therefore estimated and flagged "J".

- VII. Laboratory Control Sample (LCS) Analysis (guideline pg. E-12, Form VII)
  - 1. Was an LCS analyzed for every sample delivery group or batch of samples, whichever was more frequent?

    yes X no
  - 2. Were recoveries within the 80-120% limit?

    yes X no

-if the recoveries were outside this range the analysis must be terminated, the problem corrected and the previous samples associated with that LCS redigested and reanalyzed.

3. Were the raw data correctly transcribed onto Form VII? yes X no

Comments: All requirements met.

## VIII. Furnace Atomic Absorption (AA) QC Analysis (guidelines pg. E-14, Form VIII)

1. Does the raw data package contain absorbance values for two injections per sample, the average values and the relative standard deviation (RSD)?

yes X no

 For analyte concentrations > the CRDL, did the RSD for the duplicate injections agree within 20%? (if yes, go to question 3)

yes X no

 $RSD = \underbrace{SD}_{M} X 100$ 

SD = Standard Deviation of Duplicate Injections

M = Mean of Duplicate Injections

2a. Were samples that exceeded the 20% criteria reanalyzed? yes no

2b. Did any reanalyzed samples exceed the 20% criteria? yes no

yes no

3. Was the recovery of the spike > 40%? (if yes, go to question 4).

yes no X

If no, was the sample diluted and rerun with another spike?

yes X no

4. Was sample absorbance >50% of spike absorbance?* (if yes, go to question 5).

yes no X

* Spike absorbance = absorbance of spiked sample - absorbance of sample.

4a. For spike recoveries between 85 and 115%, were results reported to the IDL?

yes X no

 $RPD = \frac{(SSR - SR)}{SA} \times 100$ 

SSR - Spike Sample Recovery

SR = Sample Result

SA = Spike Added

- 4b. For spike recoveries outside the 85 and 115% range, were results reported to the IDL and flagged with 'W'?

  yes X no
- Was spike recovery between 85 and 115%? (if no, go to question 6)
  - 5a. Were results quantified from calibration curve and reported to IDL?

yes X no

no X

6. Was an MSA at 50, 100 and 150% of the sample absorbance analyzed?

yes

- 6a. Was each MSA analysis identified in the raw data along with the slope, intercept and correlation coefficient? yes X no
- 6b. Were these data correctly transcribed onto Form VIII?

  yes

  no
- 6c. Were correlation coefficients(r) > 0.995?

  yes

  no X
- 6d. If no, were MSAs run once more?

  yes X no
- If the correlation coefficients were still > 0.995, data on Form I must be from the run with the best 'r' and the data on Forms I and VII must be flagged with a '+'.

Were these criteria met?

yes X

no

6e. Were all MSA obtained data marked with an 'S' or an S+ on form I?

yes X no

Comments: MSA was required but not performed for sample MHP516's thallium value or for sample MHP517's arsenic value. These values are estimated and flagged "J". One correlation coefficient was <0.995 for sample MHP518's arsenic value and is flagged "J", estimated. Both correlation coefficients were <0.995 for sample MHP504's arsenic value and is considered unusable and flagged "R", rejected.

- IX. ICP Serial Dilution (L) Analysis (guidelines pg. E-12, Form IX)
  - 1. Was an ICP serial dilution performed on each group of samples of a similar matrix (i.e., soil, water) and concentration (i.e., low, high) or for each sample delivery group, whichever was more frequent?

ves X no

2. For elements with concentrations >10% the CRDL, did any exceed the serial dilution results by more than 10%? (if no, skip questions 3 and 4)

yes X no

% difference =  $\frac{I - S}{I}$  X 100

I = Initial Sample Result

- S = Serial Dilution Result (instrument reading X5)
- 3. Which elements had concentrations that exceeded the 10% criteria? For soils, arsenic and zinc.
- 4. Did the laboratory flag these data with an 'E' on Form IX?

  yes X

  no
- 5. Were the raw data correctly transcribed onto Form IX?

  yes X no

Comments: For the soil samples, the arsenic and zinc values are flagged "J", estimated due to slightly high %D's of 12.1 and 13.3%, respectively.

- X. Instrument Detection Limits (IDL) (guidelines pg. E-13, Form XI)
  - 1. Were IDLs reported for each analyzed element?

    yes X no
  - 2. Were IDLs reported for each instrument used?

    yes X no
  - Did the IDLs meet the contract requirements? (refer to pg. E-13, SOW 787)

yes X no

Comments: All requirements met.

- XI. Interelement Corrections for ICP (guidelines pg. E-13, Form XII)
  - 1. Were correction factors reported on Form XII?

Comments: All requirements met.

- XII. Linear Range Analysis (LRA) (guidelines pg. E-14, Form XII)
  - 1. Was a linear range verification standard analyzed? yes X no
  - 2. Was the results within  $\pm 5\%$  of the true value? yes no

#### Holding Times

Limits: Metals - 6 months; Hg - 30 days; Cn - 28 days.

- 1. Verified date of sample receipt by laboratory 8-16-89
- 2. Date of preparation/analyses 8-25-89
- 3. Were holding times met? yes no X

Mercury holding times were not met; therefore, all mercury values are estimated low and flagged "J".

Analyte	Matrix	Date Sampled	Prep Date	Holding Time	Holding Time Limit/Met
Mercury Mercury Metals Metals	Low soil Low water Low soil Low water	7-18-89 7-18-89	8-25-89 8-25-89 8-25-89 8-25-89	37 days 37 days 37 days 37 days	30 days no 30 days no 6 months yes 6 months yes

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS., INC. Contract: 66

Lab Code: SILVER

Case No.: 12234 SAS No.:44349

SDG No.: MHL955

Matrix (soil/water): SOIL

Lab Sample ID:

Level (low/med): LOW

Date Received: 08/16/89

% Golias:

98.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

					 	,
CAS No.	:   Analyte   !	:  Concentration  	; ; C	; : 0 ;	: М	; ;
17429-90-5	Aluminum	691		*	 P	1
17440-36-0		63.1	!		 <u>:P</u>	!
	Arsenic	220			 P	: 1749
17440-39-3	Barium	153		·*	 <u> </u>	
17440-41-7	Beryllium	0.22	Ų,		 18	1
17440-43-9	Cadmium	21.1			 LP_	1
17440-70-2	Calcium	37000			 <u>: P</u>	1
17440-47-3	Chromium	2.0	В		 12_	1
17440-48-4	Cobalt :	5.5	B		 <u> </u>	1
: <u>7440-50-8</u>	Copper	149			 <u>: P_</u>	;
17439-89-6	liron :	44700			 <u> </u>	!
17439-92-1	Lead :	2580_			 12_	;
<u>7439-95-4</u>	<u>Magnesium</u>	11200			 <u> </u>	•
7 <u>439-96-5</u>	: <u>Manganese</u> :	1440	!		 <u> </u>	B4-12/84
<u>  7439-97-6</u>	Mercury :	0.9	7	V I	<u>LCV</u>	: ~4-12/5°
1 <u>7440-02-0</u> 1	Nickel :	<u>8.2</u> _:		·	 <u>: P</u> _	t .
<u>  7440-09-7_</u>	: <u>Potassium</u> :	255_	81		 <u>: P</u> _	
(7782-49-2)	( <u>Selenium</u> )	23.6			 LE_	:
<u>  7440-22-4</u>	Silver:	12.6_}	;	<u>.*</u>	 <u>: P</u> _	ŧ
<u>  7440-23-5</u> _	:Sodium:		8:		 <u> </u>	- 40
<u>  7440-28-0</u>	: <u>Thallium</u> :			<u>NS_</u>	 E_	
<u>                                   </u>	: <u>Yanadium</u> :		₽:		 <u> </u>	_
7440-66-6_	<u> Zins</u> :	3220_		.E	 <u> </u>	丁沙
!!	CASUIGE	1			 NR	, ,
;;	·		;		 	;

Color Sefore: BROWN

Clarity Before:

Texture: MEDIUM

_blor After: YELLOW

Clarity After:

Artifacts:

EPA SAMPLE NO.

INDRGANIC ANALYSIS DATA SHEET

68-W8-0074

Lab Name: SILVER VALLEY LABS., INC.

Contract: 68-00-007

Lab Code: SILVER Case No.: 12334

SAS No.: 1-369

SDG No.: MHL955

matrix (soil/water): SOIL

Lab Sample ID:

Level (low/med): LOW

Date Received: 08/16/89

% Solids:

98.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

:7429-90-5 :Aluminum : 1040 : :* :P :	
17440-36-0 (Antimony) 84.4 ( 1 1P )	
:7440-38-2 :Arsenic : 208 : 1	T <del>48</del>
17440-39-3   Barium   86.9   1* 19	
17440-41-7 (Beryllium) 0.22 (U) IP	
7440-43-9   Cadmium   41.2	
:7440-70-2 :Calcium : 54500 : : :P :	
17440-47-3 (Chromium   6.0   1   1P	
17440-48-4   Cobalt   2.6   B    P	
17440-50-8 (Copper 205   19	
:7439-89-6 :Iron : 36500 : : :P :	
:7439-92-1 :Lead : 3060   P	
17439-95-4 (Magnesium) 18500   1 1P	
17439-96-5 (Manganese) 1740   1 1P	C 94289
17439-97-6   Mercury   1.4 1.9   TN J 451CV   0	10 7 10 0.
17440-02-0 (Nickel : 9.4   1P	
(7440-09-7 (Potassium) 496 (B) (P)	
17782-49-2 (Selenium : 12.7   1   1E	
17440-22-4 (Silver   18.5   1*   P	
17440-23-5 (Sogium   34.8   B1   1P	
17440-28-0 (Thallium ) 3.0   INS   IF   C	T ANS
17440-62-2 (Vanadium ) 3.8 (B1 1P)	_
1 <u>7440-66-6    Zinc                                   </u>	
Cyanide: INR	

Color Before: BROWN

Clarity Before:

Texture:

Color After: YELLOW

Clarity After:

Artifacts:

U.S. EPA - CLP EPA SAMPLE NO. INORGANIC ANALYSIS DATA SHEET Lao Name: SILVER VALLEY LABS., INC. Contract: 68-08-0071 MHP500 Lab Code: SILVER Case No.: 12334 SAS No.: 4174 SDG No.: MHL955 Matrix (soil/water): SOIL Lab Sample ID: Lavel (low/med): LOW Date Received: 08/16/89 % Solids: 99.2 Concentration Units (ug/L or mg/kg dry weight): MG/KG : M : 17440-36-0 (Antimony) 97.0 17440-39-3 (Barium ) 32.8 (B1* 1P) (7440-41-7 (Beryllium) 0.22 (U) 17440-43-9 | Cadmium | 95.9 | 1 | 17440-70-2 | Calcium | 68200 | 1 :7440-47-3 :Chromium : 8.8 : : 17440-48-4 (Cobalt | 7.4 |B| 1P | 17439-96-5 | Manganese | 2320 | 17439-97-6 | Mercury | 1.1 | 17440-02-0 (Nickel ) 7.1 (Bi (7440-09-7 (Potassium) 827 (B) :7782-49-2 | Selenium | 19.2 | | :7440-22-4 |Silver | 22.1 | | 17440-23-0 | Thallium | 4.2 | BIN :7440-66-6 | Zinc | 14100 | | LE | | LP | ____:Cyanide__: Color Sefore: BROWN Texture: MEDIUM Clarity Before:

Color After: YELLOW

Clarity After:

Artifacts:

C: mmenta:

7/88

EPA SAMPLE NO.

INDRGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS., INC.

Contract: de d'

Lab Code: SILVER Case No.: 12334

SAS No.: (4)47

SDG No.: MHL955

Matrix (soil/water): SOIL

Lab Sample ID:

Level (low/med): LOW

Date Received: 08/16/89

% Solids:

81.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

!	. <del> </del>						•
CAS No.	Analyte	Concentration	C		a	M	)
1	1		1			!	! !
17429-90-5	Aluminum	1030	: _ :	*		2	! !
17440-36-0	Antimony	120_	_			P	1 1
	Arsenic	259_	: _ :			<u>: P</u> _	EXT
17440-39-3	Barium	117	: _ :	<u>*</u> _		<u>: P</u> _	i
7440-41-7	Beryllium	0.27	: <u>U</u> :			<u> </u>	:
7440-43-9	Cadmium	117_	1_1			<u> </u>	!
1 <u>7440-70-2</u>	<u>Calcium</u>	5400	! <u>_                                   </u>			2	) •
17440-47-3	Chromium_	0.69	<u>ا يا</u> ا			<u> </u>	í
17440-48-4	:Cobalt	3.9	: <u>B</u>			<u> </u>	
1 <u>7440-50-8</u>	:Copper	281_	: :			<u> </u>	:
1 <u>7439-89-6</u>	Iron	97400_	:			<u>; [2</u>	1
1 <u>7439-92-1</u>	Lead	<u>9300</u> _	: <u></u>			<u> </u>	!
	: <u>Magnesium</u>		; ∄ ;				i
+ <u>7439-96-5</u>	: <u>Manganese</u>	212_	- 1			<u> </u>	LC .06
1 <u>7439-97-6</u>	Mercury	<u> </u>	·	N.		ŁCY	DC-289
+ <u>7440-02-0</u>	Nickel		<u> B</u>			<u> </u>	;
	: <u>Potassium</u> :		<u> 81</u>			- E	<b>3</b> •
:ZZ82-49-2	Selenium_	45.7	; <u>_ ;</u>			E_	
17440-22-4	Silver	<u>62.3</u> _	<u> </u>			<u>p</u> _	
	<u> Sodium</u>	603_				<u> </u>	^
: <u>7440-28-0</u>	<u>Thallium</u> :	<u> </u>				F_	BATE
1 <u>Z440=62=3</u>	: <u>Yanadium</u> _:	<u>2.6</u> _				<u> </u>	
<u>7440-66-6</u>	Zinc	16200	<u> </u>	<u>E_</u>			1XB
	Cyanide		<u> </u>			NR	
			_ ;				

Color Before: BROWN

Clarity Before:

Texture: FINE

Color After: YELLOW

Clarity After:

Artifacts:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

4-W8-0074

Lab Name: SILVER VALLEY LABS..INC. Contract:

Lab Code: SILVER Case No.: 12334 SAS No.: 44781 SDG No.: MHL955

Matrix (soil/water): SOIL

Lab Sample ID:

cevel (low/med): LOW

Date Received: 08/16/89

% Solias: 95.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

;	<u> </u>			 :		<u>-</u>	
CAS No.	Analyte	Concentration	C	:	a :	M	· 
l	·		:	!		;	1
17429-90-3	:Aluminum	240	: _ :	*		ρ	:
17440-36-0	Antimony	144	1			2	i
17440-38-2	Arsenic	175				b	:丁鸡
17440-39-3	Barium	39.5	B	<u>*</u> _		P	;
7440-41-7	Beryllium	0.23	<u>u</u>			P_	!
17440-43-9	Cadmium	250_				<u> </u>	:
: <u>7440-70-2</u>	Calcium	32800			i	P	:
17440-47-3	Chromium	0.59	<u>u</u> :			<u>P_</u>	!
17440-48-4	Cobalt	3.2	B:	- <del></del> -		<u>P</u>	;
! <u>7440-50-8</u>	Copper	265_			;	<u>P</u> _	;
<u>7439-89-6</u>	Iron	87000	:	, <del></del>		P_	í t
1 <u>7439-92-1</u>	Lead	31600	<u> :</u>			2_	i
: <u>7439-95-4</u> _:	Magnesium:	142	81		:	<u>P_</u>	:
1 <u>7439-96-5</u>	Manganese:	252_ 3		<b></b>		<u>P_</u>	
<u>  7439-97-6</u> _	Mercury;	12 x 2		M	TAS	<u>C</u>	1 06 15 19
<u>                                  </u>	Mickel :	6.2	<u>B1</u>			<u>P_</u>	•
<u>  7440-09-7_</u>	<u> Potassium </u>		B !	. — —		<u>P_</u>	, •
<u>  ZZ82-49-2</u> _	<u>Selenium</u> :	38.4	_ !			E_	;
	<u>Silver</u> /	115_	_ :	<u>*</u> _		<u>P_</u>	i
<u>                                   </u>	Sodium:	117_	<u>B1</u>			<u>- 4</u>	
<u>  7440-28-0</u>	Thallium :	6.8	<u>B:</u>	И		E_	SKT.
<u>                                   </u>	<u>Vanadium</u> :		ПŢ			<u>P_</u> :	
<u>7440-66-6</u>	<u>linc</u>	33800		E_		<u>P_</u> :	JXX
	CASUIGE :	!			:	NR:	•
	!		_;			[	

Color Before: BROWN

Clarity Before:

Texture: MEDIUM

Color After: YELLOW

Clarity After:

Artifacts:

INDRGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS., INC. Contract: 68-09-0074

Lab Code: SILVER Case No.: 12334 SAS No.: 447

SDG No.: MHL955

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med): LOW

Date Received: 08/16/89

% Solias:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

1		1			•
ICAS No.	: Analyte	Concentration	ic:	a in	i
	!		· _ ·	i	i
: <u>7429-90-5</u>	<u>Giuminum</u>	<u>26.6</u> _	: <u>81</u>	12	i
17440-36-0	<u> Antimony                                    </u>	19.9	: <u>u :</u>	- <u></u> : P	<u>;</u>
17440-38-2	Arsenic	3.3	BING	!	;
17440-39-3	Barium	51.5	1 <u>B:</u>	:2_	i
17440-41-7	Beryllium	1.1	: U :	; P	1
17440-43-9	Cadmium	2.0	181	:P_	:
17440-70-2	Calcium	147000		; P	1
	Chromium	2.8	; Ü;	; P	:
	Cobalt		: Ū <b>:</b>		1
	Copper		81	; P	:
17439-89-6	Iron	195		; P	;
17439-92-1	Lead		BIN		;
:7439-95-4	Magnesium		· ==	; P	:
	Manganese		·	-ز	
	Mercury			7 <b>05</b> ; CV	P 6-11-89
	Nickel		:U:		· 9-11
17440-09-7			: <u>8 i</u>	. <b></b> ; р	
17782-49-2	Potassium		:UIN*		R 48
	:Selenium		, 2,102	-زا:	
	Silver	`	¦ <del></del>	- <u></u> -	1
	<u>Spainm</u>	<u> </u>	' <del>- +</del>		,
17440-28-0 17440-28-0	: <u>Thallium</u>	·	<u>  4:</u>	<u>: F</u> -	•
<u> 7440-62-2</u>	⊼ <u>aoagrπw</u> -		<u>u:</u>	<u>; p</u>	1
7440-66-6_1	<u>Zinc</u>	<u>419</u>	_ <del>-</del>	<u>:P</u> _	i
<u> </u>	CASUTGE		·	inr	i
·			·		i

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS..INC. Contract: 63-83-6074

Lab Code: SILVER Case No.: 12334 SAS No.: 4434 SDG No.: MHL955

Matrix (soil/water): WATER

Lab Sample ID:

cavel (low/med): LOW

Date Received: 08/16/89

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

;	CAS No.	   Analyte	:  Concentration 	. c . c	; ; Q	m :	t t
;	Z429 <u>-90-5</u>	: <u>Aluminum</u>	75.8	! <u>:</u>	! !	<u>: 12</u>	;
;	<u> 7440-36-0</u>	: Antimony_	19.9			<u>: P_</u>	04 0
į	7440-38-2	<u> Arsenic                                    </u>		:₫.	<u> 10±</u>	<u>iĒ</u>	R X
:	<u>7440-39-3</u>	:Barium		1 <u>E</u>		<u> </u>	:
;	7440-41-7	Beryllium	1.1	: <u>U</u> _		<u>: P_</u>	:
ł	<u>7440-43-9</u>	<u>Cadmium_</u>		1 <u>8</u> .	<u> </u>	<u> </u>	;
	<u> 7440-70-2</u>	Calcium	147000	!	! !	<u> </u>	;
;	<u>7440-47-3</u>	:Chromium :		<u>ا</u> يا:		<u> </u>	t.
;	7440-48-4	Cobalt		B	···	18_	;
	7440-50-8		<u>5.6</u> _	₿.		<u>: P_</u>	}
	<u>7439-89-6</u>	:Iron :	<u> </u>		<del></del>	<u> </u>	ļ
	<u>7439-92-1</u>	Lead	<u> </u>			LE_	1 *
	7439-95-4	: Magnesium :				<u> </u>	•
- 1	Z439=96=5_	Manganese				<u> </u>	
i	7439-97-6	Mercury		3		CA	9-11-89
i	<u> 7440-02-0</u> _	Nickel		Ų,		<u> </u>	44.
	<u> </u>	<u>Potassium</u>		E		<u> </u>	222
	7782-49-2	Seleniam				<u>: F_                                   </u>	RAS
	<u>7440-22-4</u>	Silver		Ų:		<u> </u>	
	<u> </u>	1 <u>200777</u>	24100	<u> </u>		<u> </u>	
	<u> 7440-28-0</u> _	[Thallium]		Ų.		LE_	
	7440:62:2	Aspaginu		Ų.		-Ë- :	
i	<u> 7440-66-6</u>	<u> Zinc</u>	519_			<u>P_</u> :	
i		CASUTGE				NK:	
i		·		'			

Color Sefore: COLORLESS Clarity Before: CLEAR Texture:

Clarity After: CLEAR Artifacts:

EPA SAMPLE NO

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS., INC. Contract: 68-89-0071

Lab Code: SILVER Case No.: 12334 SAS No.: 94758

SDG No.: MHL955

Matrix (soil/water): WATER

Lab Samble ID:

Level (low/med): LOW

Date Received: 08/16/89

% Solias:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

			<del></del>		•
CAS No.	Analyta	Concentration	c	u m	! !
!	1	! !	i _ i		1
+ <u>7429-90-5</u> _	<u>Aluminum                                  </u>	<u> </u>	: <u>₿!</u>	<u>;</u>	;
17440-36-0	: <u>Antimony</u>	: <u>19.9</u> _	:	<u>iP</u> _	:
17440-38-2	Arsenic	:	<u> B:MM</u>	LE_	:
:7440-39-3	Barium	54.6	: <u>81</u>	<u>-4:</u>	:
17440-41-7	Beryllium	1.1	: <u>u:</u>	<u>;P_</u>	:
1 <b>7440-43-</b> 9	Cadmium	1.8	; <u>□ ;                                  </u>	<u>; p</u>	}
17440-70-2	Calcium	139000	1_1	18_	:
17440-47-3	Chromium	2.8	UI.	I P	:
	Cobalt	2.6	BI		;
:7440-50-8	Copper		:B:	T P	1 5
:7439-89-6	Iron	338	; <del></del>	; p	;
	Lead	6.2		F	ì
17439-95-4	Magnesium	34600		; P	:
17439-96-5	Manganese		1 _ 1	; P	ہد
17439-97-6	Mercury	0.2	M:U:	JASI CY	9-11-89
17440-02-0	Nickel	9.7	<u>  U                                   </u>	: P	; 7" -7
17440-09-7	Potassium	1790	B:	:P	; †
17782-49-2	Selenium	14.0	U:N*	E_	: R 48
17440-22-4	Silver	1.6	Ü:	: 2	<u> </u>
17440-23-5	Sodium	22900		٦ ؛	,
17440-28-0	Thallium	1.0	UIW_	: F	
17440-62-2	:Vanadium :	2.7	U.	<u> </u>	•
17440-66-6	Zinc	429		; P	:
1	Cyanide			INR	}
1					;

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

EPA SAMPLE NU.

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS., INC. Contract: 03-89-0071

Lab Code: SILVER Case No.: 12334 SAS No.: 643 SDG No.: MHL955

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med): LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mq/kg dry weight): UG/L

				<del>,</del> – –	1
Analyte	:  Concentration 	C	a	i IM !	i ! !
Aluminum	370	' ' . !		<u> </u>	;
Antimony	19.9	: <u>u :</u>		<u> </u>	1
Arsenic	12.2	1 1	vs	F	:
Barium	59.1	: <u>B1</u>		<u>: i5</u>	!
Beryllium	1.1	<u>: U :</u>		<u> </u>	;
Cadmium	1.8	<u>: u :</u>		2	•
Calcium .	144000	! <u>_                                   </u>		2	!
Chromium	2.8	<u>B1</u>		<u> </u>	;
				<u> </u>	) I
:Copper	11.7	BI.		P	:
:Iron				<u> </u>	;
Lead	122	11_	V*	E_	1
: Magnesium :	35600	l		P	!
<u>Manganese</u>	335_			<u> </u>	- C 04
	03	77	LIB	CV	DC 189
		MT.			
					1 2 45
Selenium	1.4	TIT			: R * 3
					6 1
Sodium	23400_1			<u>P</u> _	1
Thallium_	1.0	U:N			
: <u>Vanadium</u> _:				<u>P</u> _	1 1
	726_				}
CXSDFG6;	;		!	<u>NR</u>	}
!!			;	1	
	Aluminum Antimony Arsenic Berium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Mannesium Mannese Mercury Nickel Potassium Silver Sodium Thallium Vanagium Zinc	Aluminum   370   Antimony   19.9   Arsenic   12.2   Barium   59.1   Beryllium   1.1   Cadmium   1.8   Calcium   144000   Chromium   2.8   Cobalt   2.5   Copper   11.7   Iron   1200   Lead   122   Magnesium   35600   Manganese   335   Mercury   0.3   2.0   Mercury   0.3   2.0   Selenium   1.4   Silver   1.6   Sodium   1.4   Sodium   2.7   Zinc   726	Antimony	Aluminum   370   19.9   U    Arsenic   12.2   INS   Barium   59.1   B	Aluminum   370

Color Sefore: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

EPA SAMPLE NO

1 INDRGANIC ANALYSIS DATA SHEET

INDICATE AMERICAN SITE

Contract: 65-89-99/1

MHP509

Lab Name: SILVER VALLEY LABS..INC.

ABS..INC. Contract:

SAS No.: 61784

SDG No.: MHL955

Matrix (soil/water): WATER

Lab Sample ID:

.....

Date Received: 08/16/89

Level (low/med):

% Solids:

Lab Code: SILVER

0.0

LOW

Case No.: 12334

Concentration Units (ug/L or mg/kg dry weight): UG/L

ICAS No.	¦   Analyte 	Concentration.	: : ບ : :	    	: M : _ ! !	
17429-90-5	Aluminum	11.5	<u>: تي</u>		:	
17440-36-0	Antimony	19.9	زي:		::	
17440-38-2	Arsenic	2.3	<u>ַ</u> נֵיוַ וּ	NM	_ <u>:</u> E_	
17440-39-3	Barium	14.9	Ħ		_ <u>: P_</u> :	
17440-41-7	Beryllium	1.1_	: <u>U</u>		_ <u></u> :	ł
17440-43-9	Cadmium_	1.8	ַ עַ		<u></u>	!
17440-70-2	:Calcium_	322000	!		_ <u>:P</u> _	}
; <u>7440-47-3</u>	Chromium	2.9	ָטֵ וּ		<u>:P</u>	•
17440-48-4	Cobalt	2.8_	<u>ال</u> ا!		<u> </u>	
17440-50-8	Copper	1.9	₿.	<u> </u>	<u>_;e_</u>	i
17439-89-6	: Iron	270_	· :	 	<u>:_P</u> ;	i
17439-92-1	Lead	0.90	: <u>Ш</u>	NW*	LLE_	;
17439-95-4	Magnesium	<u>68700</u>			_ <u>:P</u>	) 
17439-96-5	Manganese	94.8	1		_ <u>1</u>	& C 00
17439-97-6	Mercury	0.2 50	ַ עַ	N IX	<u>∃1</u> C7:	9-11-89
17440-02-0	Nickel	9.7	ָטַ :	<u> </u>		•
17440-09-7	: Potassium	1480	! ₫.	<u> </u>	_ <u>P</u>	
17782-49-3	:Selenium_	14.0	֓֞֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓	N*	LLE_	RX8
17440-32-4	:Silver	1.6	<u>: U</u>			
17440-23-5	Sodium	47500	!!		<u>_1P_</u> ;	
1 <u>7440-28-0</u>	:Thallium_	1.0_	۱ <u>U</u>	W	LLE_	
1 <u>7440-62-2</u>	<u> Vanadium</u>		: <u>U</u>		_ <u>:P</u> _;	
17440-66-6	Zinc	190	! _ :		_ <u>: P_</u> :	
	Cyanide		! _ !		<u>LUR</u>	
!	!		:_ :		;;	

Color Before: COLORLESS

Clarity Before: CLEAR

Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS..INC. Contract: 55-03-0071;

Lad Code: SILVER Case No.: 12334 SAS No.: 447 SDG No.: MHL955

Matrix (soil/water): WATER

Lab Samble ID:

tavei (low/med): LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No	• Ana	alyte ;	Doncen	tration	   C 	: : a	;	М	t 1 5 1
7429-9	5-5 Alun	iinum :		368	· ; -	`	:	2	:
17440-3		mony .			; Ū	;		<u> </u>	
17440-3				9.4	18	: NW		E_	<u>'</u>
17440-3	9-3   Bari	.um :		37.0	18		1	<u>P_</u>	;
: <u>7440-4</u>	1-7   Bery	llium		1.1	: ∪	1		P_	:
1 <u>7440-4</u>	3-9_   Cadr	יבות :		2.6	ΙΒ.	1		P_	;
1 <u>7440-7</u>	2-2_ Calc	<u> 1 um    </u>		333000	١	!		<u>P_</u>	}
1 <u>7440 - 4</u> 1	Z:3_:Chro	mium !		2.9	١ <u>U</u>	<u>:</u>		<u>P_</u>	) (
: <u>7440-48</u>	<u>3-4_ Cob</u> a	115!		<u> 3.8</u>	: <u>B</u>	<u> </u>		<u>P_</u>	;
1 <u>7440 - 5</u> 9	<u>0-8_:Cop</u> p	er:		12.9_	1 <u>B</u>			<u></u>	:
17439-8		<u> </u>		1070_	1	<u>;</u>		Ρ_ :	;
17439-9	~	<u> </u> ;		<u> 131</u>		<u>! N*</u>			;
12439:55		esinu:		<u> </u>	:	<u> </u>		P	;
17439-99		lanese:		2110_	¦	<u> </u>		<u>P_</u> :	84. عو
: <u>Z499-9</u> 3		ury_;							194
<u>  7440-0:</u>				9.Z_				P :	
1 <u>7440-0</u> 1		ssium:			B			2-1	// ASD
7782-4				1_4_				E_ :	K#3
7440-2				2-4_	! <u>B.</u>			<u> </u>	
7440-2				<u> 48400                                 </u>	!				
Z440=23				<u>_1.0</u> _				<u>E_</u> :	
7440-6		ainw		<u>2.7</u> _	ιŲ		<u>:</u>		
<u> 17440-68</u>	<u>-</u>			<u>656</u> _					
	¦ <u>c</u> xau	706}					<u>-</u> -	йБ ¦	
'		;			· ·		<b>-</b> → ' -	i	

Color Before: COLORLESS Clarity Before: CLEAR

Texture:

Color After: COLORLESS Clarity After: CLEAR

Artifacts:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

Contract: 60-00-0071 Lab Name: SILVER VALLEY LABS., INC.

Lab Code: SILVER Case No.: 12334

SAS No.:

SDG No.: MHL955

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med):

LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/s or mg/kg dry weight): UG/L

: :CAS No. :	: : Analyte :	:  Concentration  	1   C	Q 	M	:
17429-90-5	:Aluminum	15.3	B		_ <u>;                                    </u>	t 1
17440-36-0	Antimony	19.9	: <u>U</u> :		<u> </u>	!
: <u>7440-38-3</u>	Arsenic	5.3	: <u>8</u>	<u> </u>	iE_	!
1 <u>7440-39-3</u>	Barium	32.1	: <u>8</u> ;	, <del></del>		}
7440-41-7	Beryllium	1.1	: U :		<u> : P</u>	i
17440-43-9	Cadmium	1.8	: UJ:		LP_	;
1 <u>7440-70-2</u>	Calcium	320000	: _ !		<u> </u>	!
1 <u>7440-47-3</u>	Chromium	2.8	<u>زن</u> ا ا		<u> : P</u> _	:
17440-48-4	Cobalt	2.6	<u>: U :</u>		<u> </u>	1
17440-50-8	Copper		: <u>U</u> :			f 1
1 <u>7439-89-6</u>	Iron	224	: _:		<u> </u>	1
	Lead	0.90	<u>: U :</u>	N*	<u>:F</u>	:
17439-95-4	: Magnesium	686 <u>00</u>	: _ :		<u> </u>	1
17439-96-5	Manganese	960	1		<u>:P</u>	
17439-97-6	Mercury	0.2	U:	NIZ	SICY	04.11-89
1 <u>7440-02-0</u>	Nickel		<u>: U</u>		<u> </u>	;
17440-09-7	Potassium	1330	<u> B:</u>		<u> </u>	}
1 <u>7782-49-2</u>	Selenium	14.0	<u>: ني</u> :	N*	<u> </u>	R43
1 <u>7440-22-4</u>	Silver	1.6	<u>: U</u> :		<u> </u>	;
17440-23-5	Sodium	46700	: :		<u> </u>	:
17440-28-0	Thallium	1.0	ı Ūį	<u> </u>	_:F_	
17440-62-2	:Vanadium	2.7	ij		<u> </u>	
	Zinc	295	\ <u> </u>		_;P_	
	Cyanide				INR	}
1					_	İ

Color Before: COLORLESS

Clarity Before: CLEAR

Color After: COLORLESS

Clarity After: CLEAR

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS., INC. Contract: 68-09-0071

Lab Code: SILVER Case No.: 12334 SAS No.: DGA7 SDG No.: MHL955

Matrix (soil/water): WATER

Lab Samble (D:

Level (low/med): LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

					<del>-</del>	~	<del></del>	
1	i Cas i	No.	:   Analyte 	:  Concentration 	; ; C ;	: : a :	; : M	; ;
i	742	9-90-5	Aluminum :	106	; <u>B</u>		·β	
i	7449	<u>2-36-0</u>	<u> Antimony_</u>	19.9	ĮЦ.		<u> </u>	;
	. <u>7440</u>	<u>)-38-2</u>	<u>Arsenic</u>	9.4	<u> </u>	!N	<u>.ie</u>	;
	7440	<u> </u>	Barium	<u> </u>	<u>B</u>	<u> </u>	<u>: P_</u>	1
- 1	<u> </u>	<u>)-41-7</u>	Beryllium:	1.1	١ <u>Ų</u>		<u> </u>	1
1	7440	) <u>-43-9</u>	Cadmium	1.8	<u>بر</u> :	!	IP_	1
i	7440	<u>-70-2</u>	Calcium_ :	303000	١	<u> </u>	<u> : P</u> _	:
;	7440	2=47=3_	Chromium_	2.8	Щ.	<u>!</u>	12_	:
;	7440	<u>)-48-4</u>	Cobalt :		Щ.		<u> </u>	;
¦	<u>7440</u>	<u> 2-50-8</u>	Copper:	4.9	且.		<u> 12</u> _	:
;	Z433	<u> </u>	Iron	1090	١	1	16	;
1	7433	2-92-1	Lead	<u>36.6</u>	١	<u> : NS*</u>	LE_	:
;	Z433	1-95-4_	Magnesium:	64900	١	<u> </u>	16	:
!	7433	1-96-5_	Manganese:	950	١		1P	1 AC 09
¦	<u> 7439</u>	<u>-97-6</u>	Mercury_:				<b>XCX</b>	PG-1-89
ł	<u>Z449</u>	<u>-02-0</u>	Nickel :	9.7	Ų.	<u>:</u>	<u>:2</u> _	1
ï	7440	<u>-09-7</u>	Potassium:	986			12	;
i	7782	<u>-49-2</u> _3	Selenium_:	14.0				: RXB
į	7440	122224_1	Silver	1.6	<u>u</u>		12_	;
;	7440	!_23_5_	Sodium :	44300_		! ! 	<u>: ۲</u> _	;
:	7440	<u> -73-0 </u>	<u>[hallium   }                                  </u>	1.0	إيا		<u> </u>	;
1		<u>:-62-2_</u>	<u>Vanadium</u> :	2.7.	<u>U</u>		<u> </u>	ì
;	7440	<u> </u>	Zinc;	002_			<u> :</u> 은 _	i
i		!	Cyanide:		:		TMB	l
;		;			_ ;		;	;

Tolor Sefore: COLORLESS Clarity Before: CLEAR Texture:

plor After: COLORLESS

Clarity After: CLEAR

Artifacts:

EPA SAMPLE NO.

INDRGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS., INC.

Contract: 68-85-0071

Lab Code: SILVER Case No.: 12334

SAS No.:

10 - 37

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med):

LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

:	:	; 1	1 1	1	:
CAS No.	: Analyte	Concentration	ic: Q	: M	1
:	:	<u> </u>	: :	1	:
7429-90-5	Aluminum	23.3	: - ; : 13 !	- ج	!
	Antimony	19.9		- تر	!
.7440-38-2	Arsenic	'		F	
				- <u>†</u>	1
	: Barium	<u>1.3</u>			1
	Beryllium		: <u>                                    </u>	<u> </u>	,
	Cadminm	1.8		<u> </u>	i
	<u>Calcium</u>	154_			;
<u>7440-47-3</u>	Chromium :	3.5_	: <u>B                                   </u>	<u> : P</u>	:
<u>7440-48-4</u>	Cobalt	2.6_	: <u>U :</u>	12_	:
7440-50-8	Copper	1.1	lui	<u> </u>	;
7439-89-6	Iron	277	1 1	; P	:
17439-93-1	Lead	0.90	:U:N*	; F	:
7439-95-4	Magnesium	42.5	BI	; P	;
: 7439-96-5	Manganese		B	; P	: 05 00
	Mercury		UIN TAS	RICV	: 9-11-87
7440-02-0	Nickel	9.7		P	; '
	Potassium	273	. U :	TP-	<b>;</b>
	Selenium		U:N*	- F	: (45)
7440-22-4	Silver	1.6		; ;	;
7440-23-5	Sodium	68.9		i P	!
	Thallium:	1.0		F	:
7440-62-2	Vanadium )	2.7			- !
		4.5		- <u>†</u> -	•
, <u> </u>	Zinc		<del>     </del>		i I
	CASUIGETT			<u> INR</u>	1
'i	i		i		i

Color Sefore: COLORLESS

Clarity Before: CLEAR

Color After: COLORLESS Clarity After: CLEAR

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS...INC. Contract: 6

Lab Code: SILVER Case No.: 12224 SAS No.:

SDG No.: MHL955

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med): LOW

Date Received: 08/16/89

% Golids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

~~~~~~~~~		هم است داره و به دمه دره و به هم دره و بند درو و برد درو و برد درو و برد درو و برد درو و برد درو و برد درو و ب د			<del></del>	
CAS No.	: Analyte 	: Concentration:			: ! M	1
7429-90-5	Aluminum	16.6	<u> </u>		<u></u>	i }
<u>7440-36-0</u>	Antimony	19.9	<u>u:</u>		12	:
7440-38-2	Arsenic	12.0	<u> </u>	<u>NS</u>	LE_	:
7440-39-3	Barium	1.3	<u>u:</u>		2	:
7440-41-7	Beryllium	1.1	nī.		<u> </u>	:
7440-43-9	Cagmium	1.8	Ů.		<u>P_</u>	!
<u>7440-70-2</u>	Calcium	56.3			2	ŀ
7440-47-3	Chromium	2.8	U.		Р	i
	Cobalt	2.6	<u>u:</u>		<u>P</u>	;
<u>7440-50-8</u>	Copper	4.4	₽:		<u> </u>	:
	Iron	219			2_	:
7439-92-1	Lead	0.90	n:	NW*	E_	; !
7439-95-4	Magnesium	20.9	<u>u:</u>		p_	! !
	Manganese		81		<u>P_</u>	ا م
7439-97-6	Mercury	0.2	UL:	BATE	CY	pg-na
7440-02-0_	Nickel	9.7	11		ا ح	i e
<u> 7440-09-7 </u>	Potassium	273_;	U1		P_ :	ł
7782-49-2	Selenium '	1.4	<u>u:</u>	N*	E_	R48
<u> </u>	Silver	1.6	UI.		P_ !	!
<u> 7440-23-5_</u> ;	Sodium :	76.0 l	B!		<u>P_</u> :	}
<u>7440-28-0</u> (Thallium :	1.0	Uil	<u>W</u> ;	E	
7440-62-2_	Vanadium :	2.7.1	UI.		P :	
<u>7440-66-6</u> ;	Zinc :	1.3	UI.		<u>P_</u> :	
!	Cyanide :	;			NR:	
!			_ 1	···		

Color Before: COLORLESS Clarity Before: CLEAR

Texture:

_Color After: COLORLESS Clarity After: CLEAR Artifacts:

EPA SAMPLE NO.

1 INDRGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS., INC. Contract: EB-D3-0071

Lab Code: SILVER Case No.: 12334 SAS No.: 14175

SDG No.: MHL955

Matrix (soil/water): WATER

Lab Sample ID:

cevel (low/med): LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

		,			- -	•
CAS No.	Analyte	Concentration	C		M	;
		32.9	- 1	<u> </u>	<u>;</u>	, ' 1
	<u>Aluminum</u>					. '
	Antimony_	<u></u>			<u></u>	. •
12440-38-3	Arsenic			<u> </u>	<u>-</u> _E_	. !
17440-39-8	Barium	102	B.	<u> </u>		. ;
17440-41-7	Beryllium	<u>1.1</u> _	١Ų	<u> </u>		. :
17440-43-9	Cadmium_	4.6	B	<u>!</u>	<u> </u>	. !
17440-70-2	Calcium_	180000_	:	<u>!</u>	:2_	,
17440-47-3	Chromium	2.8	U	!	<u> </u>	
17440-48-4	Cobalt	8.8	B	!	<u>: P</u>	1
17440-50-8	Copper	13.6	B	!	; P	1
17439-89-6	iron	267	;	···	; 2	;
17439-92-1	Lead	41.8	:	N*	: F	` ;
	Magnesium	38000	:	:	<u>; P</u>	1
17439-96-5	Manganese	2780	:	!	<u> </u>	100
	Mercury	0.2	: บิ	K T X	SICY	9-11-17
	Nickel	9.7	U	;	<u> : P</u>	1
17440-09-7	Potassium	5580	:	:	; P_	1
	Selenium	14.0	เบิ	IN*	i F	1 R 43
17440-22-4	Silver	1.6	เนิ	:	; ዖ	1
17440-23-5	Sodium	54600		!	٦,	;
17440-28-0	Thallium	14.1		 	; F	1
17440-62-2	Vanadium	2.7	Ū	;	; ၉	1
17440-66-6	Zinc	<u> 2650 :</u>	١	!	; P	1
1	Cyanide			:	INR	1
;	===================================			; ;		!
	· '		_			

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR

Artifacts:

EPA SAMPLE NU.

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS., INC. Contract: 65-W8-0074

uab Code: SILVER Case No.: 12834 SAS No.:

SDG No.: MHL955

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med):

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

				· · · · · · · · · · · · · · · · · · ·		
CAS No.	Analyte :	: (Concentration: '	C	i O	i : M '	_ lob didn
: 7429-90-5	Aluminum :	30900	ا ا إسييسا		<u>- رئ</u>	nuttiply by
7440-36-0		937		ABOR	, p	LAG THE THE
7440-38-2		dyary 5040			NF	ger dum
7440-39-3		2330_			P	SOX Y
7440-41-7	Beryllium	1.7	В		P	1
7440-43-9		289_			β	1
7440-70-2		446000			<u> </u>	1
7440-47-3	Chromium :	50.2			2	1
7440-48-4	Cobalt :	48.7	B		P	!
7440-50-8		1540			2	t I
: <u>7439-89-5</u>	Iron :	107000	1		P_	1
7439-92-1	Leac	22100			P_	:丁桓
7439-95-4_	Magnesium!	104000	_ ;		ρ_	:
: <u>7439-96-5</u> :	Manganese:	21100	_ ;		P_	
: <u>7439-97-6</u> _;	Mercury :	16.0		N JAS	CY	109-12-87
<u>7440-02-0</u> _		65.5			2_	1
Z440-09-Z_1		15600			2_	1 14 2 20
: <u>7782-49-2</u> :	Selenium !	1.2 751	U:	WIR	ZE	1 6.10 R XB
: <u>7440-22-4_</u> :		201			<u>ب</u>	1 7 .
<u> 7440-23-5</u> _		58500	:		P_	;
<u> 7440-28-0_</u> :		83.4_	:		F_	:丁格
Z440-62-2_1		58.7		ز ز مد حد سه مرو حد حد م	<u>P</u> _	;
7440-66-6_1	Zinc!	49100	_1	i	.2_	!
	Cyanide !				NR	1
			_ ;			;

"Color Before: BROWN

Clarity Before: CLOUDY Texture:

Color After: BROWN

Clarity After: CLOUDY

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS..INC. Contract: 68-63-0074

Lab Code: SILVER Case No.: 12334 SAS No.:

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med): LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

···						
CAS No.	 Analyte 	: :Concentration: :	ا ا ت ا _ ا	a	: : M : !	: :
17429-90-5	Aluminum	32.6	<u> </u>		12	!
17440-36-0	Antimony	19.9	<u>: u</u> :		19	1
17440-38-2	Arsenic	10.7	<u> </u>	<u>N</u>	1E_	- 1 2
17440-39-3	Barium	<u> </u>	81		: 2	;
1 <u>7440-41-7</u>	Beryllium	11.1	<u> []</u>		<u>lP</u>	1
17440-43-9	Cagmium	: <u>3.3</u> _:	<u>B:</u>		<u>:P</u> _	1
17440-70-2	Calcium	308000	1_1		<u>: P</u> _	!
17440-47-3	Chromium	2.8	<u> U :</u>		<u>: P_</u>	;
17440-48-4	:Cobalt	2.6	Ų,		18	1
: <u>7440-50-8</u>	Copper	12.4	B!		<u>: P</u> _	1
17439-89-6	Iron	416	<u>:</u>		<u>: P</u> _	i
: <u>7439-92-1</u>	Lead	12.9	1	N*	<u>: F</u>)
17439-95-4	Magnesium	61600	!		<u>: P</u> _	;
: <u>7439-96-5</u>	: <u>Manganese</u> :	1310	1 1	. —	<u>: P</u>	1 a C . 66
: <u>7439-97-6</u>	Mercury	0.2	:UI	K.IM	<u>TOY</u>	: 89-11-87
1 <u>7440-02-0</u>	Nickel	25.8	81		<u>:P</u>	;
17440-09-7	Potassium	273_	<u>u</u> :		<u>: P</u> _	;
1 <u>7782-49-2</u>	Selenium :	14.0_	<u>U:</u>	N*	<u>:F</u> _	iR 48
<u>7440-22-4 </u>	Gilver	1.6	<u>U:</u>		<u> : 22 </u>	!
1 <u>7440-23-5</u>	Sogium :	28800			<u> </u>	! •
17440-28-0	Thallium :	1.0	<u>U:</u>		<u>:F</u>	!
1 <u>7440-62-2</u>	<u>Vanadium</u> (2.7_	U:		<u> </u>	1
: <u>7440-66-6</u> _:	Zinc	2990_	1		<u>: P_</u>	i
!	CX9Dide:		1		INR	•
· :			_ ;		!	

Solor Sefore: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS., INC.

68-mg-2014 Contract:

Lab Code: SILVER Case No.: 12334 SAS No.:

SDG No.: MHL955

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med): LOW

Date Received: 08/16/89

% bolids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	 Analyte !	: Concentration !	 C	a a	; ; M ;	; ;
7429-90-5	Aluminum	33.7	B		; P	:
	antimony	19.9			<u> </u>	;
	Arsenic	17.4			:F	EKTI
17440-39-3	Barium	35.9	: B ;		<u> </u>	;
	Beryllium		<u> تن</u> ا		; P	:
17440-43-9	Cadmium	6.2			1 P	;
17440-70-2	Calcium	314000	! _]		: P	;
17440-47-3	Chromium	2.8	<u>زن</u> ا		<u>: P</u>	;
17440-48-4	Cobalt	2.6	<u> </u>		IP.	:
: 7440-50-8	:Copper :	5.6	B		<u> </u>	1
17439-89-6	:Iron :	696	: _ :		<u>: P</u> _	:
17439-92-1	Lead	24.9	<u> _ </u>	N*	<u>: F</u> _	i
17439-95-4	: <u>Magnesium</u> :	62700	-1		<u>: P</u> _	l f
17439-96-5	<u>Manganese</u>	1340	: _ :		<u>: P</u> _	م د مو
1 <u>7439-97-6</u>	Mercury	<u> </u>	<u>:U</u>	ء شده ند س ے دند	TCA	10441-87
: <u>7440-02-0</u>	Nickel	<u> </u>	<u>u:</u>		<u> </u>	
17440-09-7	(<u>Potassium</u>)	273_	Πī		<u>:P</u> _	2 00
1 <u>7782-49-2</u>	:Selenium_:	<u> 14.0</u>	<u>.u.</u>		<u> </u>	: R ***
17440-22-4	: <u>Silver</u> :	1.6_	<u>u</u> .		<u>- P</u> _	<u>,</u>
+ <u>7440-23-5</u>	<u> Soarum</u> :	29300_			<u>: 2</u> _	;
1 <u>7440-28-0</u>	: <u>Thallium</u> :	1.0_	<u>"u</u>		E_)
: <u>7440-62-2</u>	: <u>Vanaoium</u> :		Π:		<u>: P</u> _ :	;
+ <u>7440_56_6_</u>	Zinc	3060_			<u> </u>	
!	Cyanide:		_==		NR	
			_;		· ·	i

Color Before: COLORLESS Clarity Before: CLEAR

Texture:

-Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

Lab Name: SILVER VALLEY LABS., INC. Contract: 68-09-09

68-108-0074

Lab Code: SILVER Case No.: 12334 SAS No.:

pc 184

SDG No.: MHL955

Matrix (soil/water): WATER

Lab Sample ID:

Level (low/med): LOW

Date Received: 08/16/89

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

	1 1		: :	;	1
ICAS No.	: Analyte	Concentration	C:	(A)	;
	! ! 		¦ _		, i
17429-90-5	<u> Aluminum</u>	: <u>:7.G_</u> ;		<u>:P</u>	. :
: <u>7440-36-0</u>	· Antimony_	19.9		<u>⊹P</u> _	, :
1 <u>7440-38-2</u>	: <u>Arsenic</u>	:			, 1
: <u>7440-39-3</u>	: <u>Barium</u>	14.9	<u> </u>	<u>:P</u> _	, ;
17440-41-7	Beryllium	1.1	<u> </u>	<u>:P</u> _	, }
17440-43-9	: <u>Cadmium</u>	1.8	: UT-	<u>_</u>	. 1
1 <u>7440-70-2</u>	:Calcium	316000	-1-	<u></u>	. !
7440-47-3	Chromium	2.8_	<u> </u>	<u>:</u>	
7440-48-4	Cobalt	2.6	: <u>U:</u> _	<u>: P</u>	. 1
7440-50-8	Copper	10.4	: B:	<u> </u>	. 1
17439-89-6	:Iron	426_	<u> </u>	<u> </u>	. !
17439-92-1	Lead	1.8	UIN	* :F	. 1
17439-95-4	Magnesium	68200	; <u> </u>	<u> </u>	;
17439-96-5	:Manganese	3180	1_1_	; P	1 2 -
17439-97-6	Mercury	0.2 20	עוט:	LIXELCY	9-11-89
17440-02-0	Nickel	13.2	B!	19	
17440-09-7	: <u>Potassium</u>	2010	BI	<u>; p</u> _	
17782-49-3	Selenium	14.0	מונים:	<u>* </u>	K 75
7440-22-4	Gilver	1.6	i U I	; p	1
17440-23-5	Sogium	45000		18	:
17440-28-0	: Thallium	1.0	d I	, }=	1
7440-62-2	: <u>Vanadium</u>	1 1 1 2 2 2	<u>u</u> j_	; P	1
	:Zinc	219		; p	;
	Cyanide			INR	;
			_ ; _		;

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

APPENDIX D

RECORDS OF COMMUNICATION

DECORD OF	PHONE CALL DISCUSSION DFIELD TRIP CONFERENCE						
RECORD OF COMMUNICATION	OTHER (SPECIFY)						
	(Record of item checked a	bove)					
TO: Standley Pace	FROM: Kevin Mackey, E & E FIT	DATE					
	1/1//	November 27, 198					
	1 tacky	10:30 A.AM					
	by the G.M. Pace diverson ditch down	gradient of the					
Richardson Flat tailings	dam.						
SUMMARY OF COMMUNICATION							
Pace diversion ditch. Accord	h he and his cousin (Angus Pace) use ing to Mr. Pace, both he and his cou irrigate approximately 115 acres eac	sin own 47% of the					
	d me that the Gilmore family owns 53 es not know how much land they irrigitch.						
;							
: :							
į							
;							
•							
•							
_							
•							
CONCLUSIONS, ACTION TAKEN OR REQUIRED							
	·						
		•					
ANG COLUMN TION CONTRA							
INFORMATION COPIES TO:							

	PHONE CALL DISCUSSION FIELD TRIP CONFERENCE
RECORD OF COMMUNICATION	□ OTHER (SPECIFY) (801) 466-6094
COMMUNICATION	(Record of item checked above)
TO: James Gilmore	FROM: Susan Kennedy, E & E FIT DATE 12/11/89
Rancher	Susair Reinledy, E & E FII 12/11/09
Nanchel	TIME
	Susant Square 9:00 P.M.
Number of acres and use of 1	and irrigated from G.M. Pace Ditch
SUMMARY OF COMMUNICATION	
When asked the number of acres ir use of the land, Mr. Gilmore prov	rigated by the G.M. Pace Ditch and the nature of rided the following information:
- Approximately 100 (between 95 t from the G.M. Pace Ditch.	o 110) acres of his land are irrigated by water
- The irrigated land is used to g	row alfalfa, and to graze sheep.
•	
ACTION TO THE TOTAL THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL T	
CONCLUSIONS, ACTION TAKEN OR REQUIRED	lateral and the secondation remained by courfees
water —— Richardson Flat Tailin	o determine the population served by surface
water Richardson Flat lailin	gs into package.
	•
INFORMATION COPIES	
TO:	



ecology and environment, inc.

1776 SOUTH JACKSON STREET, DENVER, COLORADO 80210, TEL. 303-757-4984

International Specialists in the Environment

Janet Liner, FIT-RPO Susan Kennedy, E & E FIT TO.

FROM

DATE December 20, 1989

SUBJECT: Transmittal of Supplemental Site Inspection Report for

Richardson Flat Tailings, Summit County, Utah,

TDD F08-8903-06, PAN FUT0039HDA.

Attached is a copy of the Supplemental Site Inspection Report for Richardson Flat Tailings (TDD F08-8903-06). This report is a revised edition of the draft report entitled Sampling Activities Report and Analytical Results Report for Richardson Flat Tailings, submitted to you by Kevin Mackey on October 13, 1989.

If you have any questions, please contact Kevin Mackey or me at 757-4984.

cc: Thomas Burns (2 copies)



ecology and environment, inc.

1776 SOUTH JACKSON STREET, DENVER, COLORADO 80210, TEL. 303-757-4984

International Specialists in the Environment

To: T. Burns

From: S. Kennedy, FIT

Date: December 20, 1989

Re: Supplemental Site Inspection Report, Richardson Flats

TDD #F08-8903-06.

Attached is the revised Richardson Flats report. In our view, it is still a draft document until you have reviewed and concur with its language. If you have any questions, please cntact me.